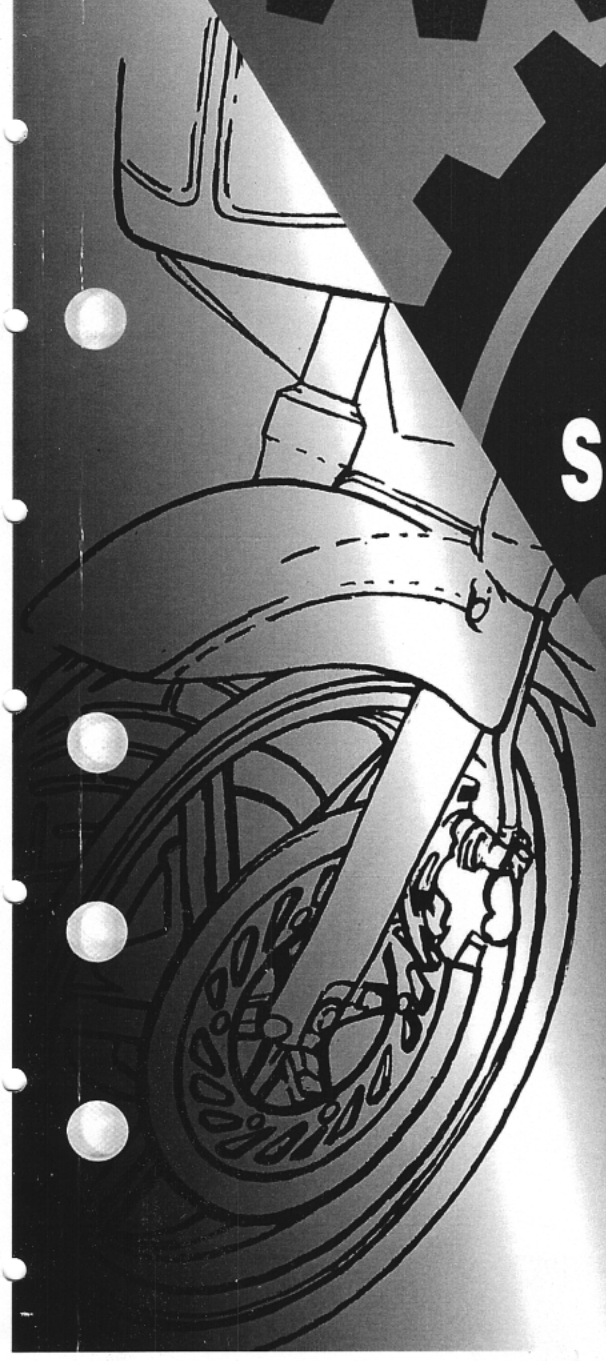
2002

HONDA



SERVICE MANUAL

CBR954RR

HOW TO USE THIS MANUAL

This service manual describes the service procedures for the CBR954RR.

Follow the Maintenance Schedule (Section 3) recommendations to ensure that the vehicle is in peak operating condition.

Performing the first scheduled maintenance is very important. It compensates for the initial wear that occurs during the break-in period.

Sections 1 and 3 apply to the whole motorcycle. Section 2 illustrates procedures for removal/installation of components that may be required to perform service described in the following sections.
Section 4 through 19 describe parts of the motorcycle, grouped according to location.

Find the section you want on this page, then turn to the table of contents on the first page of the section.

Most sections start with an assembly or system illustration, service information and troubleshooting for the section. The subsequent pages give detailed procedure.

If you don't know the source of the trouble, go to section *21,* Troubleshooting.

Your safety, and the safety of others, is very important. To help you make informed decisions we have provided safety messages and other information throughout this manual. Of course, it is not practical or possible to warn you about all the hazards associated with servicing this vehicle. You must use your own good judgement.
You will find important safety information in a variety of forms including:
- Safety Labels – on the vehicle
- Safety Messages – preceded by a safety alert symbol ⚠ and one of three signal words, DANGER, WARNING, or CAUTION.
  These signal words mean:

⚠ DANGER **You** WILL be KILLED or SERIOUSLY HURT if you don't follow instructions.

⚠ WARNING You CAN be KILLED or SERIOUSLY HURT if you don't follow instructions.

⚠ CAUTION You CAN be HURT if you don't follow instructions.

- Instructions – how to service this vehicle correctly and safely.

As you read this manual, you will find information that is preceded by a NOTICE symbol. The purpose of this message is to help prevent damage to your vehicle, other property, or the environment.

CONTENTS

	GENERAL INFORMATION	1
	FRAME/BODY PANELS/EXHAUST SYSTEM	2
	MAINTENANCE	3
ENGINE AND DRIVE TRAIN	LUBRICATION SYSTEM	4
	FUEL SYSTEM (Programmed Fuel Injection)	5
	COOLING SYSTEM	6
	ENGINE REMOVAL/INSTALLATION	7
	CYLINDER HEAD/VALVES	8
	CLUTCH/GEARSHIFT LINKAGE	9
	ALTERNATOR/STARTER CLUTCH	10
	CRANKCASE/PISTON/CYLINDER	11
	CRANKSHAFT/TRANSMISSION	12
CHASSIS	FRONT WHEEL/SUSPENSION/ STEERING	13
	REAR WHEEL/SUSPENSION	14
	HYDRAULIC BRAKE	15
ELECTRICAL	BATTERY/CHARGING SYSTEM	16
	IGNITION SYSTEM	17
	ELECTRIC STARTER	18
	LIGHTS/METERS/SWITCHES	19
	WIRING DIAGRAMS	20
	TROUBLESHOOTING	21
	INDEX	22

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SYMBOLS

The symbols used throughout this manual show specific service procedures. If supplementary information is required pertaining to these symbols, it would be explained specifically in the text without the use of the symbols.

	Replace the part(s) with new one(s) before assembly.
	Use the recommended engine oil, unless otherwise specified.
	Use molybdenum oil solution (mixture of the engine oil and molybdenum grease in a ratio of 1:1).
	Use multi-purpose grease (lithium based multi-purpose grease NLGI #2 or equivalent).
	Use molybdenum disulfide grease (containing more than 3% molybdenum disulfide, NLGI #2 or equivalent). Example: Molykote® BR-2 plus manufactured by Dow Corning, U.S.A. Multi-purpose M-2 manufactured by Mitsubishi Oil, Japan
	Use molybdenum disulfide paste (containing more than 40% molybdenum disulfide, NLGI #2 or equivalent). Example: Molykote® G-n Paste manufactured by Dow Corning, U.S.A. Honda Moly 60 (U.S.A. only) Rocol ASP manufactured by Rocol Limited, U.K. Rocol Paste manufactured by Sumico Lubricant, Japan
	Use silicone grease.
	Apply a locking agent. Use a medium strength locking agent unless otherwise specified.
	Apply sealant.
	Use DOT 4 brake fluid. Use the recommended brake fluid unless otherwise specified.
	Use fork or suspension fluid.

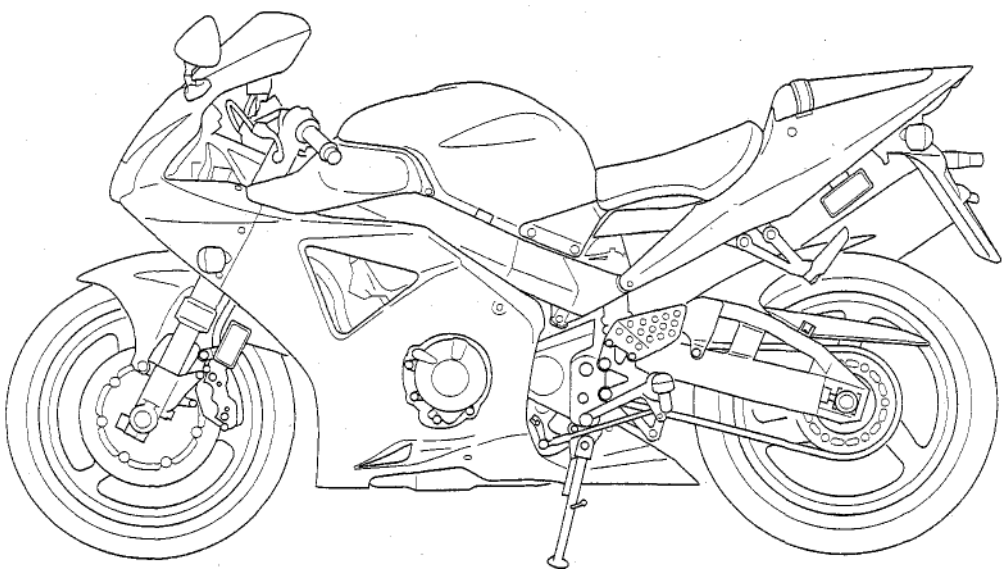
1. GENERAL INFORMATION

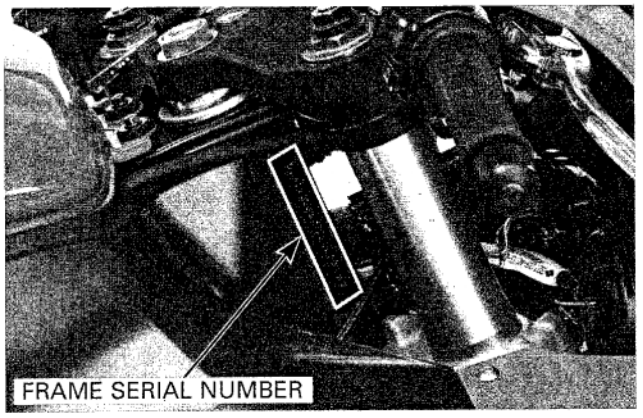
SERVICE RULES	1-1	LUBRICATION & SEAL POINTS	1-19
MODEL IDENTIFICATION	1-1	CABLE & HARNESS ROUTING	1-23
SPECIFICATIONS	1-3	EMISSION CONTROL SYSTEMS	1-37
TORQUE VALUES	1-12	EMISSION CONTROL INFORMATION LABELS	1-40
TOOLS	1-17		

SERVICE RULES

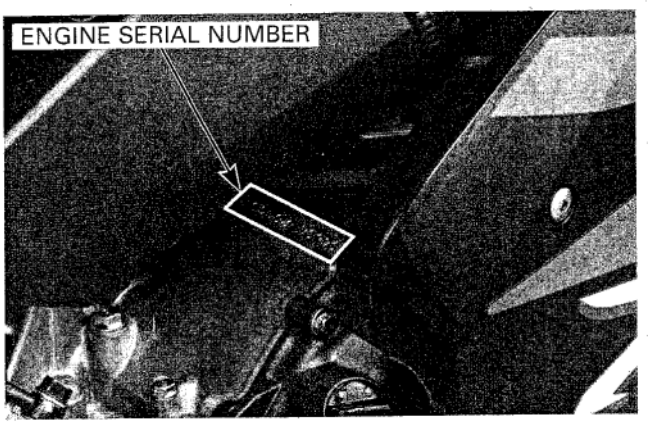
1. Use genuine Honda or Honda-recommended parts and lubricants or their equivalents. Parts that do not meet Honda's design specifications may cause damage to the motorcycle.
2. Use the special tools designed for this product to avoid damage and incorrect assembly.
3. Use only metric tools when servicing the motorcycle. Metric bolts, nuts and screws are not interchangeable with English fasteners.
4. Install new gaskets, O-rings, cotter pins, and lock plates when reassembling.
5. When tightening bolts or nuts, begin with the larger diameter or inner bolt first. Then tighten to the specified torque diagonally in incremental steps unless a particular sequence is specified.
6. Clean parts in cleaning solvent upon disassembly. Lubricate any sliding surfaces before reassembly.
7. After reassembly, check all parts for proper installation and operation.
8. Route all electrical wires as shown on pages *1-23* through *1-36*, Cable and Harness Routing.

MODEL IDENTIFICATION

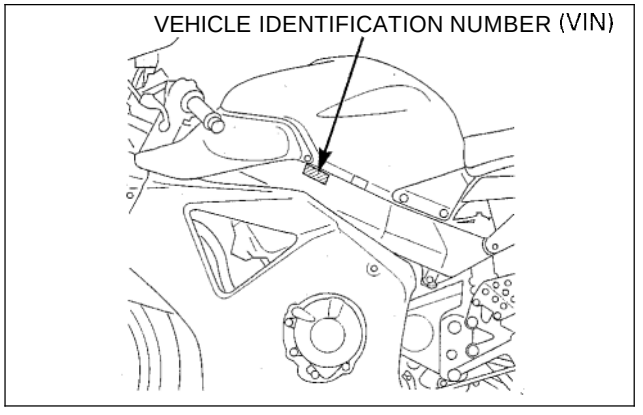




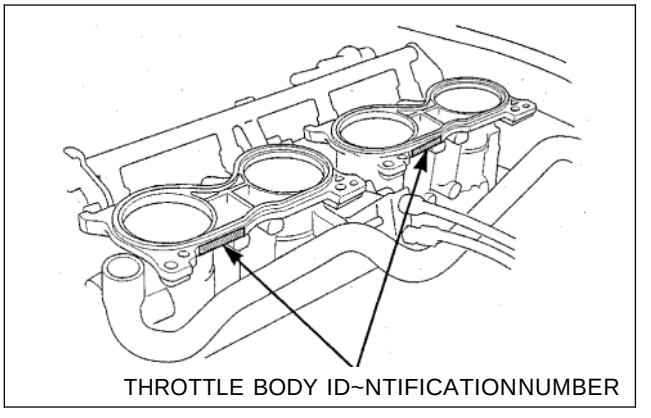
(1) The frame serial number is stamped on the right side of the steering head.



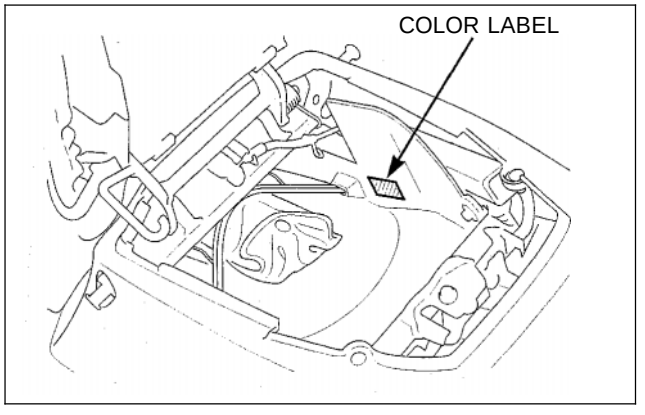
(2) The engine serial number is stamped on the right side of the upper crankcase.



(3) The Vehicle Identification Number (VIN) is located on left side of the main frame on the Safety Certification Labels.



(4) The throttle body identification number is stamped on the intake side of the throttle body as shown.



(5) The color label is attached as shown. When ordering color-coded parts, always specify the designated color code.

SPECIFICATIONS

GENERAL

ITEM		SPECIFICATIONS
DIMENSIONS	Overall length	2,025 mm (79.7 in)
	Overail width	680 mm (26.8 in)
	Overall height	1,135 mm (44.7 in)
	Wheelbase	1,395 mm (54.9 in)
	Seat height	820 mm (32.3 in)
	Footpeg height	383 mm (15.1 in)
	Ground clearance	130 mm (5.1 in)
	Dry weight	
	49 states, Canada type:	168 kg (370 lbs)
	California type:	170 kg (375 lbs)
	Curb weight	
	49 states, Canada type:	195 kg (430 lbs)
	California type:	197 kg (434 lbs)
	Maximum weight capacity	
	49 states, California type:	160 kg (353 lbs)
	Canada type:	164 kg (362 lbs)
FRAME	Frame type	Diamond
	Front suspension	Inverted telescopic fork
	Front wheel travel	110 mm (4.3 in)
	Rear suspension	Swingarm
	Rear wheel travel	135 mm (5.3 in)
	Rear damper	Nitrogen gas filled damper
	Front tire size	120/70 ZR17 M/C (58W)
	Rear tire *size*	190/50 ZR17 M/C (73W)
	Tirebrand	
	Bridgestone	Front: BT012F RADIAL G /Rear: BT012R RADIAL G
	Michelin	Front: Pilot SPORT E /Rear: Pilot SPORT E
	Front brake	Hydraulic double disc brake with 4 pots caliper
	Rear brake	Hydraulic single disc brake with 1 pots caliper
	Caster angle	23" 45'
	Trail length	97 mm (3.8 in)
	Fuel tank capacity	18.0 liter (4.76 **US** gal, 3.96 Imp gal)
ENGINE	Cylinder arrangement	4 cylinders in-line, inclined 30" from vertical
	Bore and stroke	75.0 x 54.0 mm (2.95 x 2.13 in)
	Displacement	954 cm3 (58.2 cu-in)
	Compression ratio	11.5: 1
	Valve train	Chain driven, DOHC
	Intake valve opens (at 1 mm (0.04 in) lift)	25' BTDC
	Intake valve closes (at 1 mm (0.04 in) lift)	38" ABDC
	Exhaust valve opens (at 1 mm (0.04 in) lift)	41" BBDC
	Exhaust valve closes (at 1 mm (0.04 in) lift)	22° ATDC
	Lubrication system	Forced pressure and wet sump
	Oil pump type	Trochoid
	Cooling system	Liquid cooled
	Air filtration	Paper element
	Engine dry weight	61.2 kg (134.9 lbs)
	Firing order	1 – 2 – 4 – 3

GENERAL (Cont'd)

ITEM			SPECIFICATIONS
CARBURATION	Type		PGM-FI (Programmed Fuel Injection)
	Throttle bore		42 mm (1.7 in)
DRIVE TRAIN	Clutch system		Multi-plate, wet
	Clutch operation system		Cable operating
	Transmission		Constant mesh, 6-speeds
	Primary reduction		1.520 (73/48)
	Final reduction		2.687 (43/16)
	Gear ratio	1st	2.692 (35/13)
		2nd	1.933 (29/15)
		3rd	1.600 (32/20)
		4th	1.400 (28/20)
		5th	1.285 (27/21)
		6th	1.190 (25/21)
	Gearshift pattern		Left foot operated return system, **1** – N – 2 – 3 – **4** – 5 – 6
ELECTRICAL	Ignition system		Computer-controlled digital transistorized with electric advance
	Starting system		Electric starter motor
	Charging system		Triple phase output alternator
	Regulator/rectifier		SCR shorted/triple phase, full wave rectification
	Lighting system		Battery

Unit: mm (in)

		STANDARD	SERVICE LIMIT
Engine oil capacity	At draining	3.5 liter (3.7 US qt, 3.1 Imp qt)	—
	At oil filter change	3.7 liter (3.9 US qt, 3.3 Imp qt)	—
	At disassembly	4.0 liter (4.2 US qt, 3.5 Imp qt)	—
		Pro Honda GN4 or HP4 (without molybdenum additives) 4-stroke oil or equivalent motor oil API service classification: SG or higher JASO T 903 standard: MA Viscositv: SAE 1OW-40	—
		490 kPa (5.0 kgf/cm², 71 psi) at 5,400 rpm/(80°C/176°F)	—
Oil pump rotor	Tip clearance	0.15 (0.006)	0.20 (0.008)
	Body clearance	0.15 – 0.22 (0.006 – 0.009)	0.35 (0.014)
	Side clearance	0.02 – 0.07 (0.001 – 0.003)	0.10 (0.004)

ITEM		SPECIFICATIONS
Throttle body identification number	Except California type	GQ44C
	California type	GQ44B
Starter valve vacuum difference		20 mmHg
Base throttle valve for synchronization		No.1
Idle speed		1,200 ± 100 rpm
Throttle grip free play		2 – 6 mm (1/16 – 1/4 in)
Intake air temperature sensor resistance (at 20°C/68°F)		1 – 4 kΩ
Enqine coolant temperature sensor resistance (at 20°C/68°F)		2.3 – 2.6 kΩ
Fuel injector resistance (at 20°C/68°F)		10.5 – 14.5 Ω
PAIR solenoid valve resistance (at 20°C/68°F)		20 – 24 Ω
Cam pulse generator peak voltage (at 20°C/68°F)		0.7 V minimum
Ignition pulse generator peak voltage (at 20°C/68°F)		0.7 V minimum
Manifold absolute pressure at idle		150 – 250 mmHg
Fuel pressure at idle		343 kPa (3.5 kgf/cm², 50 psi)
Fuel pump flow (at 12 V)		188 cm³ (6.4 US oz, 6.6 Imp oz) minimum/10 seconds

ITEM		SPECIFICATIONS
Coolant capacity	Radiator and engine	3.1 liter (3.3 US qt, 2.7 Imp qt)
	Reserve tank	0.4 liter (0.4 US qt, 0.4 Imp qt)
Radiator cap relief pressure		108 – 137 kPa (1.1 – 1.4 kgf/cm², 16 – 20 psi)
Thermostat	Begin to open	80.5 – 83.5°C (177 – 182°F)
	Fully open	95°C (203°F)
	Valve lift	8 mm (0.3 in) minimum
Recommended antifreeze		Pro Honda HP Coolant or an equivalent high quality ethylene glycol antifreeze containing corrosion protection inhibitors
Standard coolant concentration		1:1 mixture of antifreeze and soft water

CYLINDER HEAD/VALVES

Unit: mm (in)

ITEM			STANDARD	SERVICE LIMIT
Cylinder compression			1,196 kPa (12.2 kgf/cm², 174 psi) at 350 rpm	—
Valve clearance		IN	0.16 ± 0.03 (0.006 ± 0.001)	—
		EX	0.27 ± 0.03 (0.011 ± 0.001)	—
Cam shaft	Cam lobe height	IN	36.74 – 36.98 (1.446 – 1.456)	36.72 (1.446)
		EX	36.45 – 36.69 (1.435 – 1.444)	36.43 (1.434)
	Runout		—	0.04 (0.002)
	Oil clearance		0.020 – 0.062 (0.0008 – 0.0024)	0.10 (0.004)
Valve lifter	Valve lifter O.D.	IN/EX	25.978 – 25.993 (1.0228 – 1.0233)	25.97 (1.022)
	Valve lifter bore I.D.	IN/EX	26.010 – 26.026 (1.0240 – 1.0246)	26.04 (1.025)
Valve, valve guide	Valve stem O.D.	IN	4.475 – 4.490 (0.1762 – 0.1768)	4.465 (0.1758)
		EX	4.465 – 4.480 (0.1758 – 0.1764)	4.455 (0.1754)
	Valve guide I.D.	IN/EX	4.500 – 4.512 (0.1722 – 0.1776)	4.540 (0.1787)
	Stem-to-guide clearance	IN	0.010 – 0.037 (0.0004 – 0.0015)	—
		EX	0.020 – 0.047 (0.0008 – 0.0019)	—
	Valve guide projection above cylinder head	IN	14.3 – 14.6 (0.56 – 0.57)	—
		EX	12.4 – 12.7 (0.49 – 0.50)	—
	Valve seat width	IN/EX	0.90 – 1.10 (0.035 – 0.043)	1.5 (0.06)
Valve spring free length	IN	Inner	34.80 (1.370)	33.1 (1.30)
		Outer	37.97 (1.495)	36.1 (1.42)
	EX		39.60 (1.559)	37.6 (1.48)
Cylinder head warpage			—	0.10 (0.004)

Unit: mm (in)

CLUTCH/GEARSHIFT LINKAGE

ITEM			STANDARD	SERVICE LIMIT
Clutch lever free play			10 – 20 (3/8 – 13/16)	—
Clutch spring free length			48.8 (1.92)	47.4 (1.87)
Clutch disc thickness			2.92 – 3.08 (0.115 – 0.121)	2.6 (0.10)
Clutch plate warpage			—	0.30 (0.012)
Clutch outer guide		I.D.	25.000 – 25.021 (0.9843 – 0.9851)	25.03 (0.985)
		O.D.	34.975 – 34.991 (1.3770 – 1.3776)	34.97 (1.377)
Mainshaft O.D. at clutch outer guide			24.980 – 24.993 (0.9835 – 0.9840)	24.96 (0.983)
Shift fork, forkshaft	Fork	I.D.	12.000 – 12.018 (0.4724 – 0.4731)	12.03 (0.474)
		Claw thickness	5.93 – 6.00 (0.233 – 0.236)	5.9 (0.23)
	Fork shaft O.D.		11.957 – 11.968 (0.4707 – 0.4712)	11.95 (0.470)

ITEM	STANDARD	SERVICE LIMIT
Starter driven sear boss O.D.	51.699 – 51.718 (2.0354 – 2.0361)	51.684 (2.0348)

Unit: mm (in)

CRANKCASE/PISTON/CYLINDER

ITEM			STANDARD	SERVICE LIMIT
			—	0.10 (0.004)
	Taper		—	0.10 (0.004)
	Warpage		—	0.05 (0.002)
Piston, piston rings	Piston mark direction		"O" mark facing toward the intake side	—
	Piston pin O.D.		16.994 – 17.000 (0.6691 – 0.6693)	16.98 (0.669)
	Piston-to-piston pin clearance		0.002 – 0.014 (0.0001 – 0.0006)	—
	Piston ring-to-ring groove clearance	Top	0.030 – 0.065 (0.0012 – 0.0026)	0.08 (0.003)
		Second	0.015 – 0.045 (0.0006 – 0.0018)	0.06 (0.002)
	Piston ring end gap	Top	0.28 – 0.38 (0.011 – 0.015)	0.5 (0.02)
		Second	0.40 – 0.55 (0.016 – 0.022)	0.7 (0.03)
Cylinder-to-piston clearance			0.020 – 0.055 (0.0008 – 0.0022)	—
Connecting rod small end I.D.			17.016 – 17.034 (0.6699 – 0.6706)	17.04 (0.671)
Connecting rod-to-piston pin clearance			0.016 – 0.040 (0.0006 – 0.0016)	—
Crank pin oil clearance			0.030 – 0.052 (0.0012 – 0.0020)	0.062 (0.0024)

CRANKSHAFT/TRANSMISSION

ITEM			STANDARD	SERVICE LIMIT
Crankshaft	Side clearance		0.05 – 0.20 (0.002 – 0.008)	0.30 (0.012)
	Runout		—	0.03 (0.001)
	Main journal oil clearance		0.017 – 0.035 (0.0007 – 0.0014)	0.045 (0.0018)
Transmission	Gear I.D.	M5, M6	31.000 – 31.025 (1.2205 – 1.2215)	31.04 (1.222)
		C1	26.000 – 26.021 (1.0236 – 1.0244)	26.04 (1.025)
		c2, c3, c4	33.000 – 33.025 (1.2992 – 1.3002)	33.04 (1.301)
	Bushing O.D.	M5, M6	30.950 – 30.975 (1.2185 – 1.2195)	30.93 (1.218)
		c3, c4	32.950 – 32.975 (1.2972 – 1.2982)	32.93 (1.296)
	Bushing I.D.	M5	27.985 – 28.006 (1.1018 – 1.1026)	28.02 (1.103)
		c2	29.985 – 30.006 (1.1805 – 1.1813)	30.02 (1.182)
	Gear-to-bushing clearance	M5, M6	0.025 – 0.075 (0.0010 – 0.0030)	0.11 (0.004)
		c3, c4	0.025 – 0.075 (0.0010 – 0.0030)	0.11 (0.004)
	Mainshaft O.D.	M5	27.967 – 27.980 (1.1011 – 1.1016)	27.957 (1.1007)
		Clutch outer guide	24.980 – 24.993 (0.9835 – 0.9840)	24.96 (0.983)
	Countershaft O.D.	C2	29.967 – 29.980 (1.1798 – 1.1803)	29.96 (1.180)
	Bushing-to-shaft clearance	M5	0.005 – 0.039 (0.0002 – 0.0015)	0.08 (0.003)
		c2	0.005 – 0.039 (0.0002 – 0.0015)	0.08 (0.003)

Minimum tire tread depth		—	1.5 (0.06)
Cold tire pressure	Up to 90 kg (200 lb) load	250 kPa (2.50 kgf/cm², 36 psi)	—
	Up to maximum weight capacity	250 kPa (2.50 kgf/cm², 36 psi)	—
Axle runout		—	0.20 (0.008)
Wheel rim runout	Radial	—	2.0 (0.08)
	Axial	—	2.0 (0.08)
Wheel balance weigh		—	60 g (2.1 oz) max.
Fork	Spring free length	255.8 (10.07)	250.8 (9.87)
	Spring direction	With the tapered end facing up	—
	Fork pipe runout	—	0.20 (0.008)
	Recommended fork oil	Pro Honda Suspension Fluid SS-8	—
	Fluid level	73 (2.9)	—
	Fluid capacity	513 ± 2.5 cm³ (17.3 ± 0.08 US oz, 18.1 ± 0.09 Imp oz)	—
	Pre-load adjuster initial setting	7 turns from full soft	—
	Rebound adjuster initial setting	2 turns from full hard	—
	Compression adjuster initial setting	2 turns from full hard	—

ITEM			STANDARD	SERVICE LIMIT
Minimum tire tread depth			—	2.0 (0.08)
Cold tire pressure	Up to 90 kg (200 lb) load		290 kPa (2.90 kgf/cm², 42 psi)	—
	Up to maximum weight capacity		290 kPa (2.90 kgf/cm², 42 psi)	—
Axle runout			—	0.20 (0.008)
Wheel rim runout	Radial		—	2.0 (0.08)
	Axial		—	2.0 (0.08)
Wheel balance weight			—	60 g (2.1 oz) max.
Drive chain	Size/link	DID	DID 50VA8 C1/108	—
		RK	RK GB50HFOZ5/108	—
	Slack		40 – 50 (1.6 – 2.0)	50 (2.0)
Shock absorber	Spring adjuster standard position		4th groove	—
	Rebound adjuster initial setting		2 turns from full hard	—
	Compression adjuster initial setting		2 turns from full hard	—

ITEM			STANDARD	SERVICE LIMIT
Front	Specified brake fluid		Honda DOT 4 Brake Fluid	—
	Brake disc thickness		4.5 (0.18)	3.5 (0.14)
	Brake disc runout		—	0.30 (0.012)
	Master cylinder I.D.		17.460 – 17.503 (0.6874 – 0.6891)	17.515 (0.6896)
	Master piston O.D.		17.321 – 17.367 (0.6819 – 0.6837)	17.309 (0.6815)
	Caliper cylinder I.D.	Upper	32.025 – 32.035 (1.2608 – 1.2612)	32.05 (1.262)
		Lower	30.250 – 30.280 (1.1909 – 1.1921)	30.29 (1.193)
	Caliper piston O.D.	Upper	31,965 – 31.998 (1.2585 – 1.2598)	31.953 (1.2580)
		Lower	30.082 – 30.115 (1.1843 – 1.1856)	30.074 (1.1840)
Rear	Specified brake fluid		Honda DOT 4 Brake Fluid	—
	Brake disc thickness		5.0 (0.20)	4.0 (0.16)
	Brake disc runout		—	0.30 (0.012)
	Master cylinder I.D.		15.870 – 15.913 (0.6248 – 0.6265)	15.925 (0.6270)
	Master piston O.D.		15.827 – 15.854 (0.6231 – 0.6242)	15.815 (0.6226)
	Caliper cylinder I.D.		38.180 – 38.230 (1.5031 – 1.5051)	38.24 (1.506)
	Caliper cylinder O.D.		38.098 – 38.148 (1.4999 – 1.5019)	38.090 (1.4996)

Battery	Capacity		12V – 8.6 Ah
	Current leakage		0.2 mA max.
	Voltage (20°C/68°F)	Fully charged	13.0 – 13.2 V
		Needs charging	Below 12.3 V
	Charging current	Normal	0.9 A/5 – 10 h
		Quick	4.0 A10.5 h
Alternator	Capacity		0.421 kW/5,000 rpm
	Charging coil resistance (20°C/68°F)		0.1 – 1.0 Ω

IGNITION SYSTEM

ITEM		SPECIFICATIONS
Spark plug	Standard	IMR9C-9H (NGK), VUH27D (DENSO)
	Optional	IMR8C-9H (NGK), VUH24D (DENSO)
Spark plug gap		0.80 – 0.90 mm (0.031 – 0.035 in)
Ignition coil peak voltage		100 V minimum
Ignition pulse generator peak voltage		0.7 V minimum
Ignition timing ("F" mark)		13° BTDC at idle

Starter motor brush length	10.0 – 10.5 (0.39 – 0.41)	3.5 (0.14)

ITEM			SPECIFICATIONS
Bulbs	Headlight	Hi	12v – 55w X 2
		Lo	12V – 55W
	Brake/tail light		LED
	Front turn signal light		12V – 32/3cp (23/8W) X 2
	Rear turn signal light		12V – 32cp (23W) X 2
	License light		12V – 5W
	Instrument light		LED
	Turn signal indicator		LED X 2
	High beam indicator		LED
	Neutral indicator		LED
	Oil pressure indicator		LED
	PGM-FI warning indicator		LED
	Fuel reserve indicator		LED
Fuse	Main fuse		30 A
	PGM-FI fuse		20 A
	Sub fuse		20A X 2, 10A X 3
Tachometer peak voltage			10.5V minimum
Thermo sensor resistance		80 ˚C (176°F)	2.1 – 2.6 kΩ
		120 ˚C (248°F)	0.65 – 0.73 kΩ

TORQUE VALUES

FASTENER TYPE	TORQUE N·m (kgf·m, lbf·ft)	FASTENER TYPE	TORQUE N·m (kgf·m, lbf·ft)
5 mm hex bolt and nut	5 (0.5, 3.6)	5 mm screw	4 (0.4, 2.9)
10 mm hex bolt and nut	34 (3.5, 25)	small flange)	
12 mm hex bolt and nut	54 (5.5, 40)	6 mm flange bolt (8 mm head, large flange)	12 (1.2, 9)

- Torque specifications listed below are for important fasteners.
- Others should be tightened to standard torque values listed above.

NOTES: 1. Apply sealant to the threads.
2. Apply a locking agent to the threads.
3. Apply grease to the threads.
4. Stake.
5. Apply oil to the threads and flange surface.
6. Apply clean engine oil to the O-ring.
7. U-nut
8. ALOC bolt: replace with a new one.
9. CT bolt
10. Apply molybdenum disulfide oil to the threads and seating surface (after removing anti-rust oil additive).
11. One-way bolt

ENGINE

ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N·m (kgf·m, lbf·ft)	REMARKS
MAINTENANCE:				
Spark plug	4	10	12 (1.2, 9)	
Timing hole cap	1	45	18 (1.8, 13)	NOTE 3
Oil drain bolt	1	12	29 (3.0, 22)	
Oil filter cartridge	1	20	26 (2.7, 20)	NOTE 6
LUBRICATION SYSTEM:				
Oil cooler mounting bolt	1	20	74 (7.5, 54)	
Oil pump assembly flange bolt	1	6	8 (0.8, 5.8)	NOTE 9
Oil pump driven sprocket bolt	1	6	15 (1.5, 11)	NOTE 2
Oil pressure switch	1	PT 1/8	12 (1.2, 9)	NOTE 1
Oil pressure switch wire terminal screw	1	4	2 (0.2, 1.4)	
Lower crankcase 20 mm sealing bolt	1	20	29 (3.0, 22)	NOTE 2
FUEL SYSTEM (Programmed Fuel Injection):				
ECT (Engine Coolant Temperature)/thermo sensor	1	12	23 (2.3, 17)	
Throttle body insulator band screw	8	5	See page 1-14	
Throttle cable bracket mounting bolt	2	5	3 (0.35, 2.5)	
Fuel pipe mounting bolt	3	6	10 (1.0, 7)	
Pressure regulator mounting bolt	2	6	10 (1.0, 7)	
Starter valve synchronization plate screw	4	3	1 (0.09, 0.7)	
Fast idle wax unit link plate screw	1	3	1 (0.09, 0.7)	
Fast idle wax unit mounting screw	2	6	5 (0.5, 3.6)	
Starter valve lock nut	4	10	2 (0.18, 1.3)	
COOLING SYSTEM:				
Water pump cover flange bolt	2	6	12 (1.2, 9)	NOTE 9
Thermostat cover flange bolt	2	6	12 (1.2, 9)	NOTE 9
ENGINE MOUNTING:				
Drive sprocket special bolt	1	10	54 (5.5, 40)	

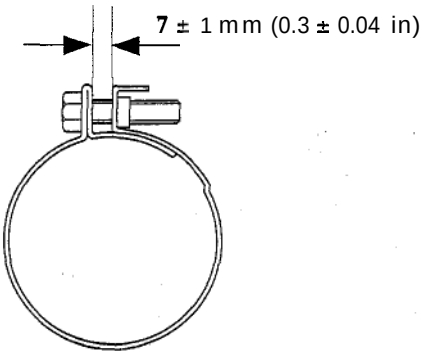
ENGINE (Cont'd)

ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N•m (kgf•m, lbf•ft)	REMARKS
CYLINDER HEAD/VALVES:				
Cylinder head cover bolt	4	6	10 (1.0, 7)	
PAIR reed valve cover flange bolt	4	6	12 (1.2, 9)	NOTE 2
Breather plate flange bolt	3	6	12 (1.2, 9)	NOTE 2
Camshaft holder flange bolt	20	6	12 (1.2, 9)	NOTE 5
Cylinder head sealing bolt	1	18	27 (2.8, 20)	NOTE 2
Cylinder head mounting bolt	2	8	25 (2.5, 18)	NOTE 5
Cylinder head mounting bolt/washer	10	9	51 (5.2, 38)	NOTE 10
Cam sprocket bolt	4	7	20 (2.0, 14)	NOTE 2
Cam pulse generator rotor bolt	2	6	12 (1.2, 9)	NOTE 2
Cam chain tensioner pivot socket bolt	1	6	10 (1.0, 7)	NOTE 2
Cam chain guide mounting socket bolt	1	6	12 (1.2, 9)	NOTE 2
Cylinder head stud bolt (exhaust pipe stud bolt)	8	8	See page 1-14	
CLUTCH/GEARSHIFT LINKAGE:				
Clutch center lock nut	1	22	127 (13.0, 94)	NOTE 4,5
Clutch spring bolt/washer	5	6	12 (1.2, 9)	
Shift drum center socket bolt	1	8	23 (2.3, 17)	NOTE 2
Shift drum stopper arm pivot bolt	1	6	12 (1.2, 9)	
Gearshift return spring pin	1	8	23 (2.3, 17)	
Shift drum bearing/shift fork retaining bolt/washer	2	6	12 (1.2, 9)	NOTE 2
ALTERNATOR/STARTER CLUTCH:				
Alternator wire clamp bolt	1	6	14 (1.4, 10)	NOTE 9
Flywheel flange bolt	4	10	103 (10.5, 76)	NOTE 5
Stator mounting socket bolt	4	6	12 (1.2, 9)	
Starter one-way clutch torx bolt	6	6	16 (1.6, 12)	NOTE 2
CRANKCASE/PISTON/CYLINDER:				
Mainshaft bearing set plate bolt	3	6	12 (1.2, 9)	NOTE 2
Crankcase bolt, 10 mm	1	10	39 (4.0, 29)	
9 mm (main journal bolt)	10	9	20 (2.0, 14) + 150°	See page 11-12 NOTE 5
8 mm	12	8	25 (2.5, 18)	
Connecting rod nut	8	8	35 (3.6, 26)	NOTE 5
Upper crankcase sealing bolt	1	8	22 (2.2, 16)	NOTE 2
Lower crankcase 20 mm sealing bolt	1	20	29 (3.0, 22)	NOTE 2
Lower crankcase 10 mm socket bolt	1	10	12 (1.2, 6.5)	NOTE 2

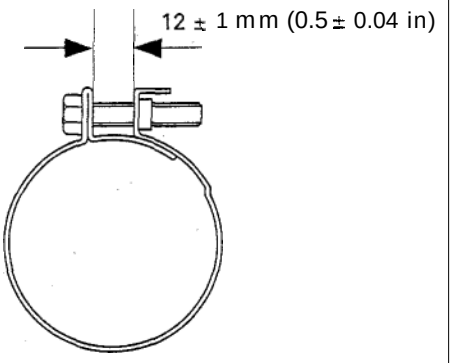
ENGINE (Cont'd)

ITEM	Q'TY	DIA. (mm)	N•m (kgf•m, lbf•ft)	REMARKS
IGNITION SYSTEM:				
Ignition pulse generator rotor mounting bolt	1			NOTE **5**
ELECTRIC STARTER:				
Starter motor terminal nut	2			
LIGHTS/METERS/SWITCHES:				
Neutral switch	1		1	

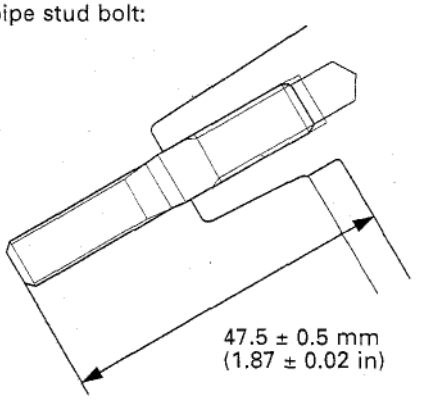
Insulator clamp (Throttle body side):



insulator clamp (Cylinder head *side):*

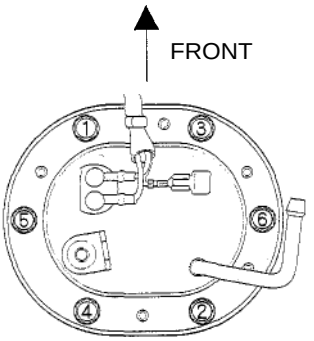


Exhaust pipe stud bolt:



FRAME

ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N·m (kgf·m, lbf·ft)	REMARKS
FRAME BODY PANELS/EXHAUST SYSTEM:				
Upper cowl stay mounting bolt	2	8	26 (2.7, 20)	
Upper cowl stay mounting SH bolt	3	6	7 (0.7, 5.1)	
Upper cowl pan screw	4	5	1.5 (0.15, 1.1)	
Lower cowl pan screw	2	5	1.5 (0.15, 1.1)	
Rear cowl truss screw	2	5	1.5 (0.15, 1.1)	
Pillion seat mounting nut	2	6	11 (1.1, 8)	NOTE7
Pillion seat hinge special screw	2	6	12 (1.2, 9)	
Duct cover pan screw	4		1.5 (0.15, 1.1)	
Windscreen mounting screw	7	5	0.3 (0.03, 0.22)	See page 2-8
Seat rail mounting bolt, 8 mm		8	39 (4.0, 29)	
Seat rail mounting nut, 10 mm	2	10	39 (4.0, 29)	
Pillion step mounting socket bolt	4	8	39 (4.0, 29)	
Exhaust pipe joint nut	8	7	12 (1.2, 9)	
FUEL SYSTEM (Programmed Fuel Injection):				
Fuel filler cap bolt	7	4	2 (0.2, 1.4)	
Fuel hose banjo bolt (fuel tank side)	1	12	22 (2.2, 16)	
Fuel hose sealing nut (throttle body side)	1	12	22 (2.2, 16)	
Fuel pump mounting nut (see tightening sequence below)	6	6	12 (1.2, 9)	
Bank angle sensor mounting screw	2	6	11 (1.1, 8)	
Exhaust valve mounting bolt (front)	4	6	14 (1.4, 10)	
(rear)	4	6	14 (1.4, 10)	
Exhaust valve cover mounting bolt	2	6	12 (1.2, 9)	
Exhaust valve pulley nut	1	6	12 (1.2, 9)	
Exhaust valve pulley cover mounting bolt	2		12 (1.2, 9)	
O_2 sensor (California type only)	1	12	25 (2.6, 19)	
COOLING SYSTEM:				
Cooling fan nut	1	5	3 (0.3, 2.2)	
Fan motor nut	3	5	5 (0.5, 3.6)	
Fan motor shroud mounting bolt	3	6	8 (0.8, 5.8)	
ENGINE MOUNTING:				
Main footpeg bracket mounting socket bolt	4	8	39 (4.0, 29)	
Main footpeg mounting bolt	2	10	44 (4.5, 33)	NOTE 8
Lower bracket mounting nut	2	10	42 (4.3, 31)	See page 7-12 NOTE 7
Lower bracket mounting pinch bolt	4	8	26 (2.7, 20)	
Engine hanger bolt (front)	2	10	39 (4.0, 29)	See page 7-7
Engine hanger bolt (middle)	2	12	54 (5.5, 40)	
Engine hanger nut (rear)	1	12	54 (5.5, 40)	
Rear engine hanger pinch bolt	1	8	26 (2.7, 20)	
Side stand bracket bolt	2	10	44 (4.5, 33)	NOTE 8
Side stand pivot bolt	1	10	10 (1.0, 7)	
Side stand pivot lock nut	1	10	29 (3.0, 22)	NOTE 7



FRAME (Cont'd)

ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N·m (kgf·m, lbf·ft)	REMARKS
CLUTCH/GEARSHIFT LINKAGE:				
Gearshift pedal link pinch bolt	1	6	10 (1.0, 7)	NOTE 8
FRONT WHEEL/SUSPENSION/STEERING:				
Handlebar pinch bolt	2	8	26 (2.7, 20)	
Handlebar weight mountign screw	2	6	10 (1.0, 7)	NOTE 8
Steering stem nut	1	24	103 (10.5, 76)	See page 13-30
Steering stem adjusting nut	1	26	20 (2.0, 14)	
Steering stem lock nut	1	26	—	
Fork top bridge pinch bolt	2	8	23 (2.3, 17)	
Fork bottom bridge pinch bolt	4	8	26 (2.7, 20)	
Front axle bolt	1	18	78 (8.0, 58)	
Front axle holder pinch bolt	4	8	22 (2.2, 16)	
Front brake disc mounting bolt	12	6	20 (2.0, 14)	NOTE 8
Fork bolt	2	42	23 (2.3, 17)	
Fork center bolt	2	10	34 (3.5, 25)	
REAR WHEEL/SUSPENSION:				
Rear axle nut	1	22	113 (11.5, 83)	NOTE 7
Rear brake disc mounting bolt	4	8	42 (4.3, 31)	NOTE 8
Driven sprocket nut	6	10	64 (6.5, 47)	NOTE 7
Rear shock absorber upper mounting nut	1	10	44 (4.5, 33)	NOTE 7
Rear shock absorber upper bracket mounting nut	1	16	93 (9.5, 69)	NOTE 7
Shock arm plate nut	3	10	44 (4.5, 33)	NOTE 7
Shock link nut (frame side)	1	10	44 (4.5, 33)	NOTE 7
Swingarm pivot nut	1	24	118 (12.0, 87)	NOTE 7
Swingarm pivot pinch bolt	2	8	26 (2.7, 20)	
Drive chain slider bolt	3	6	9 (0.9, 6.5)	NOTE 8
HYDRAULIC BRAKE:				
Front brake master cylinder cup mounting nut	1	6	6 (0.6, 4.3)	NOTE 7
Brake lever pivot bolt	1	6	1 (0.1, 0.7)	
Brake lever pivot nut	1	6	6 (0.6, 4.3)	
Front brake light switch screw	1	4	1 (0.1, 0.7)	
Front brake caliper mounting bolt	4	8	30 (3.1, 22)	NOTE 8
Caliper body assembly torx bolt	8	8	23 (2.3, 17)	NOTE 2
Front caliper pad pin	4	10	18 (1.8, 13)	
Rear caliper pad pin	1	10	18 (1.8, 13)	
Rear caliper pad pin plug	1	10	3 (0.3, 2.2)	
Brake caliper bleeder	3	8	6 (0.6, 4.3)	
Rear brake hose clamp screw	1	5	4 (0.4, 2.9)	NOTE 8
Brake pedal joint nut	1	8	18 (1.8, 13)	
Rear master cylinder push rod lock nut	1	8	18 (1.8, 13)	
Rear master cylinder hose joint screw	1	4	1 (0.15, 1.1)	NOTE 2
Rear brake caliper pin bolt	1	12	27 (2.8, 20)	NOTE 2
Rear brake caliper bolt	1	8	23 (2.3, 17)	NOTE 2
Brake hose oil bolt	5	10	34 (3.5, 25)	
LIGHTS/METERS/SWITCHES:				
Ignition switch mounting one-way bolt	2	8	26 (2.7, 20)	NOTE 11
Side stand switch mountinq bolt	1	6	10 (1.0, 7)	

TOOLS

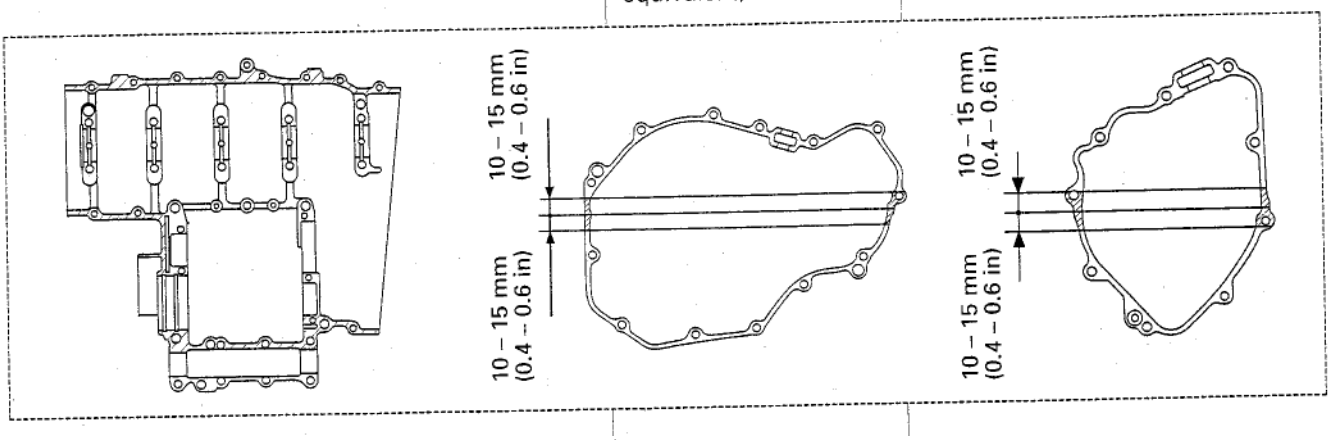
NOTES: 1. Equivalent commercially available in U.S.A.
2. Alternative tool.
3. Newly designed tool.
4. Not available in U.S.A.

DESCRIPTION	TOOL NUMBER	REMARKS	REF. SEC.
ECM test harness, 26P	070MZ-0010100		5
Fuel pressure gauge	07406-0040003	NOTE 2: 07406-004000A (U.S.A. only)	5
Oil pressure gauge set	07506-3000001	NOTE 1	4
Oil pressure gauge attachment	07510-MA70000	NOTE 1	4
Clutch center holder	07724-0050002		9
Flywheel holder	07725-0040000	NOTE 1	10
Rotor puller	07733-0020001	NOTE 2: 07933-3950000 (U.S.A. only)	10
Attachment, 42 x 47 mm	07746-0010300		9, 13, 14
Attachment, 52 x 55 mm	07746-0010400		14
Attachment, 22 x 24 mm	07746-0010800		14
Attachment, 40 x 42 mm	07746-0010900		14
inner driver, 40 mm I.D.	07746-0030100		12
Attachment, 25 mm I.D.	07746-0030200		12
Pilot, 17 mm	07746-0040400		14
Pilot, 25 mm	07746-0040600		13, 14
Pilot, 35 mm	07746-0040800		9
Bearing remover shaft	07746-0050100		13, 14
Bearing remover head, 25 mm	07746-0050800		13, 14
Driver	07749-0010000		9, 13, 14
Valve spring compressor	07757-0010000		8
Valve seat cutter		NOTE 1	8
Seat cutter, 24.5 mm (45° EX)	07780-0010100		
Seat cutter, 29 mm (45° IN)	07780-0010300		
Flat cutter, 28 mm (32° EX)	07780-0012100		
Flat cutter, 30 mm (32° IN)	07780-0012200		
interior cutter, 26 mm (60° EX)	07780-0014500		
Interior cutter, 30 mm (60° IN)	07780-0014000		
Cutter holder, 4.5 mm	07781-0010600		
Snap ring pliers	07914-SA50001		15
Steering stem socket	07916-3710101	NOTE 2: 07916-3710100 (U.S.A. only)	13
Rod holder, 24 x 27 mm	07930-KA50100		7, 14
Driver attachment, A	07946-KM90100	NOTE 4	13
Driver shaft assembly	07946-KM90300	NOTE 4	13
Bearing remover, A	07946-KM90401	NOTE 4	13
Assembly base	07946-KM90600	NOTE 4	13
Steering stem driver	07946-MB00000		13
Driver shaft	07946-MJ00100		14
Fork seal driver body	07947-KA50100		13
Driver	07949-3710001		14
Valve spring compressor attachment	07959-KM30101		8
Driver shaft	07964-MB00200		12
Oil filter wrench	07HAA-PJ70101	NOTE 2: 07HAA-PJ70100	3, 4
Peak voltage adaptor	07HGJ-0020100	NOTE 4 NOTE 1: IgnitionMate peak voltage tester (U.S.A. only)	5, 17, 19
Tappet hole protector	07HMG-MR70002	NOTE 4	8
Valve guide driver, 4.5 mm	07HMD-ML00101		8
Valve guide reamer, 4.5 mm	07HMH-ML00101	NOTE 1: 07HMH-ML0010A (U.S.A. only)	8
Drive chain tool set	07HMH-MR10103	NOTE 1: 07HMH-MR1010C (U.S.A. only)	3
Needle bearing remover	07LMC-KV30100		14
Vacuum gauge set	07LMJ-001OOOA		5
Pilot, 32 x 50 mm	07MAD-PR90200		14

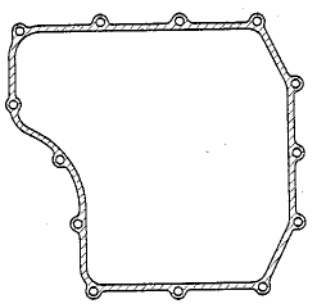
DESCRIPTION	TOOL NUMBER	REMARKS	REF. SEC.
Race remover	07NMF-MT70110	NOTE 4	13
Driver attachment	07NMF-MT70120	NOTE 4	13
Compression gauge attachment	07RMJ-MY50100		8
Fork damper holder handle	07TMB-00101OA		13
Installer attachment, A	07VMF-MAT0100	U.S.A. only	13
Installer attachment, B	07VMF-MAT0200	U.S.A. only	13
Remover attachment, A	07VMF-MAT0300	U.S.A. only	13
Remover attachment, B	07VMF-MAT0400	U.S.A. only	13
Fork damper holder	07YMB-MCF0101		13
Oil seal driver	07YMD-MCF0100	NOTE 1: 07NMD-KZ3010A (U.S.A. only)	13
Driver attachment, 25 x 38.5 mm	07YMD-MCJ0100		14
Installer shaft guide	07YMF-MCJ0100	NOTE 2: 07YMF-MCJA100 (U.S.A. only)	5
Installer shaft	07YMF-MCJ0200	NOTE 2: 07YMF-MCJA200 (U.S.A. only)	5
installer shaft, 14 x 30 mm	07YMF-MCJ0300	NOTE 2: 07YMF-MCJA300 (U.S.A. only)	5
Remover, 14 x 16 mm	07YMF-MCJ0400	NOTE 2: 07YMF-MCJA400 (U.S.A. only)	5
Cam chain tensioner holder	07ZMG-MCAA400	U.S.A. only	3, 8
Batterv tester	BM-210-AH	NOTE 2: BM-210 (U.S.A. only)	16

LUBRICATION & SEAL POINTS

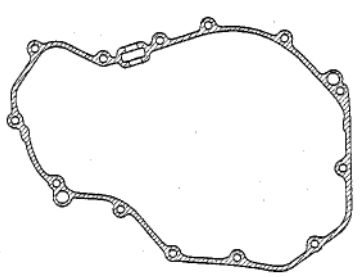
LOCATION	MATERIAL	REMARKS
Crankcase mating surface	Liquid sealant (Three Bond 1207B or equivalent)	



Oil pan mating surface

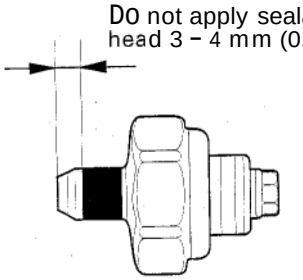


Right crankcase cover mating surface

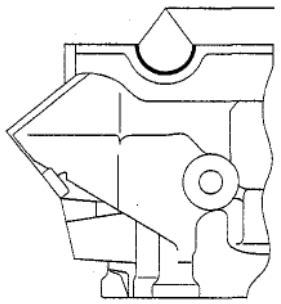
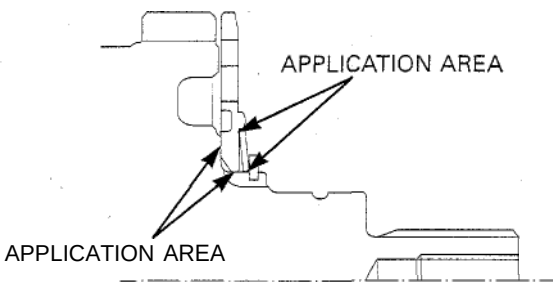


Oil pressure switch threads

Do not apply sealant to the thread head 3 – 4 mm (0.1 – 0.2 in)



ENGINE (Cont'd)

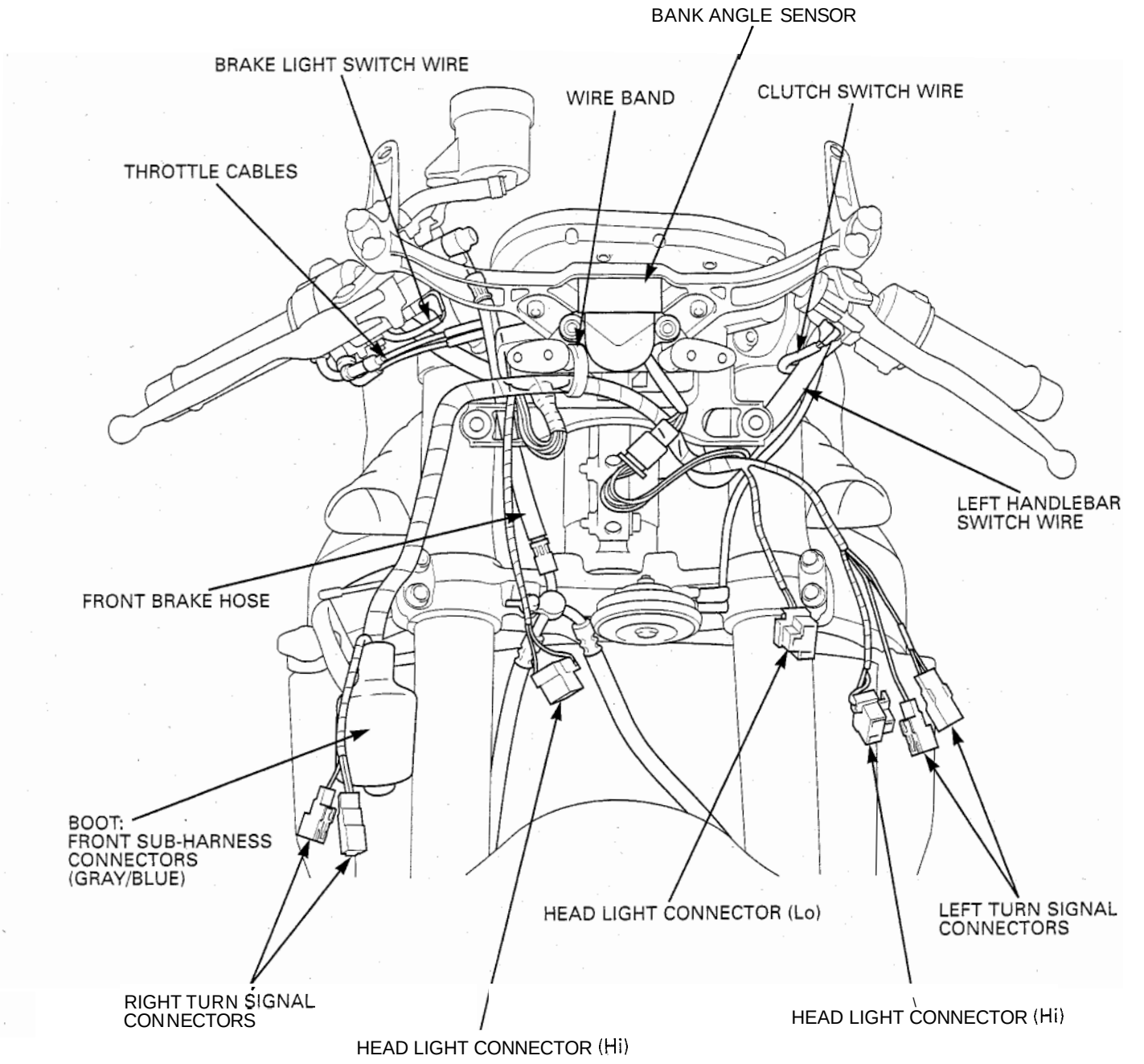
LOCATION	MATERIAL	REMARKS
Cylinder head semi-circular cut-out 	Sealant	
Main journal bearing surface Piston pin sliding surface Connecting rod bearing surface Connecting rod small end inner surface Crankshaft thrust surface Camshaft lobes/journals and thrust surface Valve stem (valve guide sliding surface) Valve lifter outer sliding surface Clutch outer/primary driven gear sliding surface Clutch outer guide sliding surface M3/4, C5, C6 shifter gear (shift fork grooves) Starter reduction gear shaft outer surface Cylinder head special bolt (after removing anti-rust oil additive) Primary sub-gear friction spring sliding surface 	Molybdenum disulfide oil (a mixture of 1/2 engine oil and 1/2 molybdenum disulfide grease	
Piston ring sliding area Oil strainer packing Clutch disc surface Starter one-way clutch sliding surface Connecting rod nut threads Flywheel bolt threads and seating surface Main journal 9 mm bolt threads and seating surface (after removing anti-rust oil additive) Clutch center lock nut threads Oil filter cartridge threads and O-ring Camshaft holder bolt threads and seating surface Oil cooler center bolt threads Each gear teeth and rotating surface Each bearing rotating area Each O-ring Other rotating area and sliding surface	Engine oil	

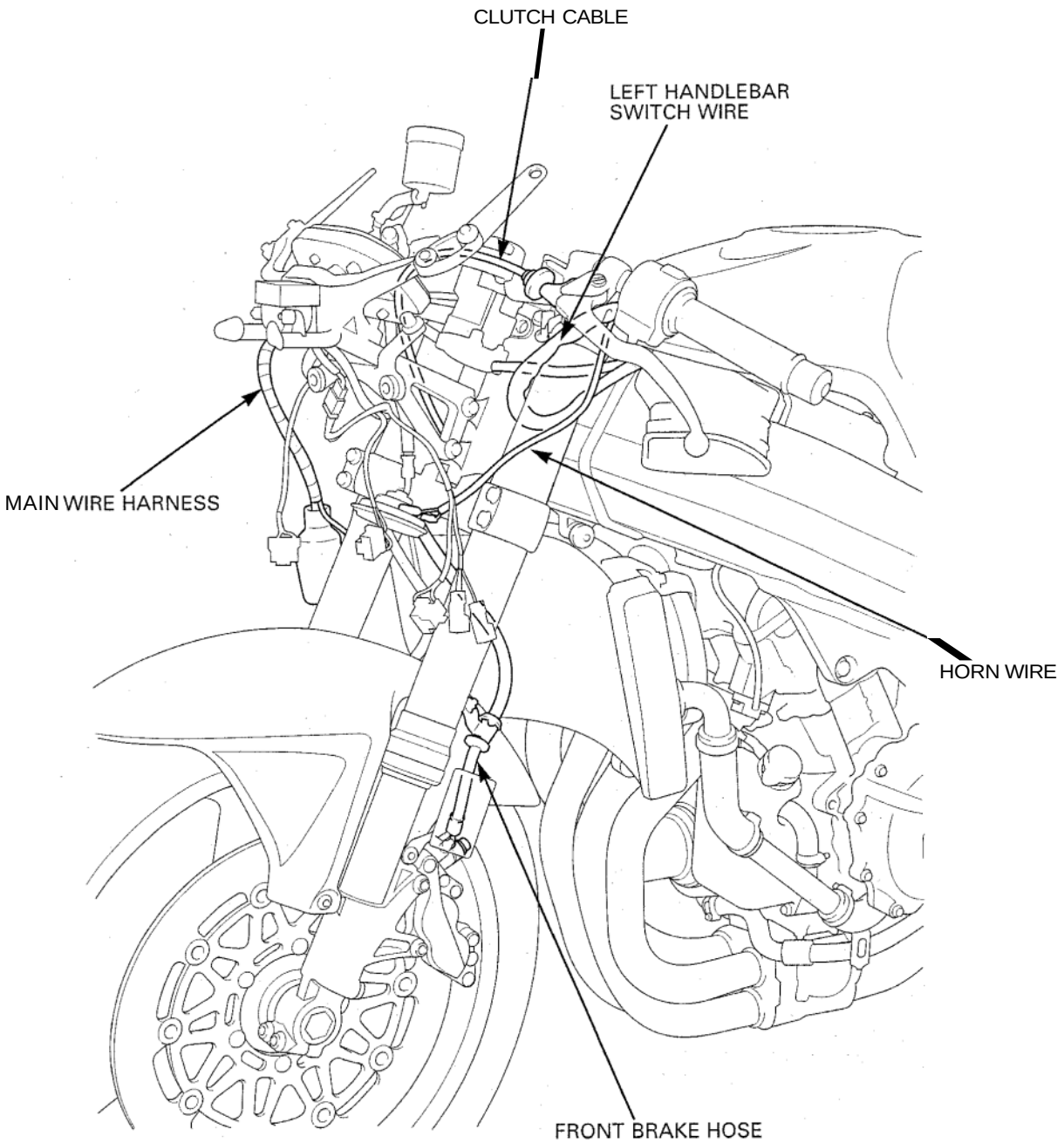
LOCATION	MATERIAL	REMARKS
Timing hole cap threads Each oil seal lip	Multi-purpose grease	
Upper crankcase sealing bolt threads Lower crankcase sealing bolt threads Cam chain guide A mounting bolt threads Cam pulse generator rotor bolt threads Cylinder head sealing bolt threads Cylinder head cover breather joint threads Starter one-way clutch outer bolt threads Oil pump driven sprocket bolt threads Shift drum bearing set plate bolt threads Mainshaft bearing set plate bolt threads Cam sprocket bolt threads Cylinder head cover breather plate bolt threads Shift drum center bolt threads Cam chain tensioner pivot bolt threads Cam chain guide pivot bolt threads Gearshift return spring pin	Locking agent	Coating width: 6.5 ± 1 mm

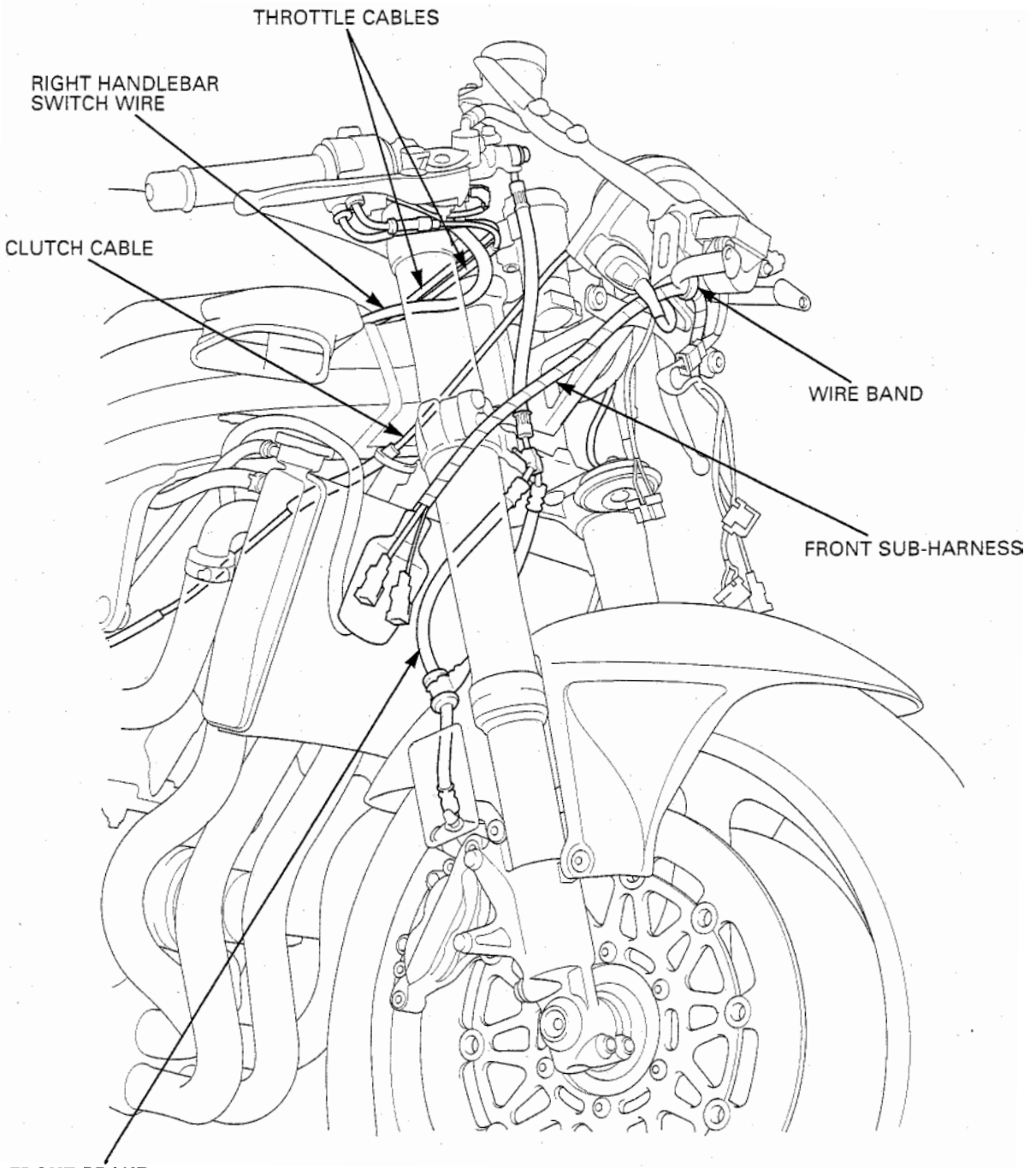
FRAME

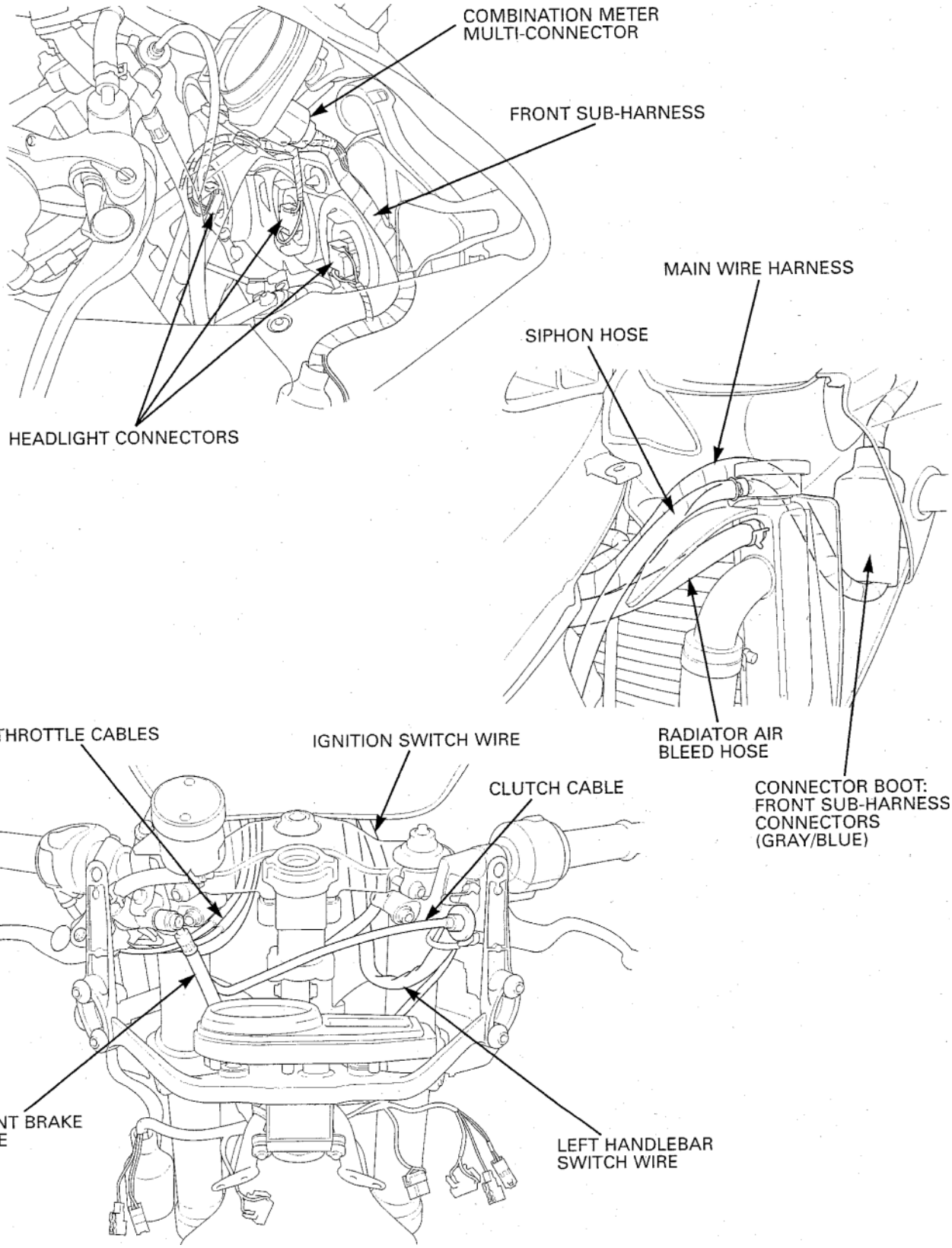
LOCATION	MATERIAL	REMARKS
Front wheel dust seal lips Rear wheel dust seal lips Rear wheel hub O-ring Footpeg sliding area Pillion footpeg sliding area Rear brake pedal pivot sliding area Gearshift pedal pivot sliding area Gearshift pedal tie-rod ball joint Clutch lever pivot bolt sliding area Throttle pipe sliding area Pillion seat pivot sliding area Pillion seat catch hook Pillion seat spring sliding area Side stand pivot surface Throttle pipe cable sliding surface	Multi-purpose grease	
Steering head bearing sliding surface Steering head dust seal lips Swingarm pivot bearings	Urea based multi-purpose grease for extreme pressure (example: EXCELITE EP2 manufactured by KYODO YUSHI, Japan, Shell Stamina EP2) or equivalent	
Swingarm pivot bearings Swingarm pivot dust seal lips Shock arm and link dust seal lips Shock arm and link needle bearings Shock absorber needle bearing Shock absorber dust seal lips	Multi-purpose grease (Shell Alvania EP2 or equivalent)	
Side stand pivot surface Throttle pipe cable sliding surface	Molybdenum disulfide grease	
Shock absorber spring adjuster cam surface	Molybdenum paste	
Steering stem top thread Brake pipe joint threads	Engine oil	
Throttle cable A, B casing inner Clutch cable casing inner Variable air intake valve cable inner Exhaust gas control valve cable A, B casing inner	Cable lubricant	
Brake master cylinder cups Brake caliper piston seals	DOT 4 brake fluid	
Brake caliper dust seals Front brake lever pivot and piston tips Rear master cylinder boot inside and push rod tips Rear brake caliper slide pin surface	Silicone grease	
Rear brake caliper slide pin threads Rear master cylinder hose joint screw threads Driven sprocket stud bolt threads	Locking agent	
Handlebar grip rubber inside	Honda Bond A	
Fork cap O-ring Fork oil seal lips	Fork fluid	

CABLE & HARNESS ROUTING

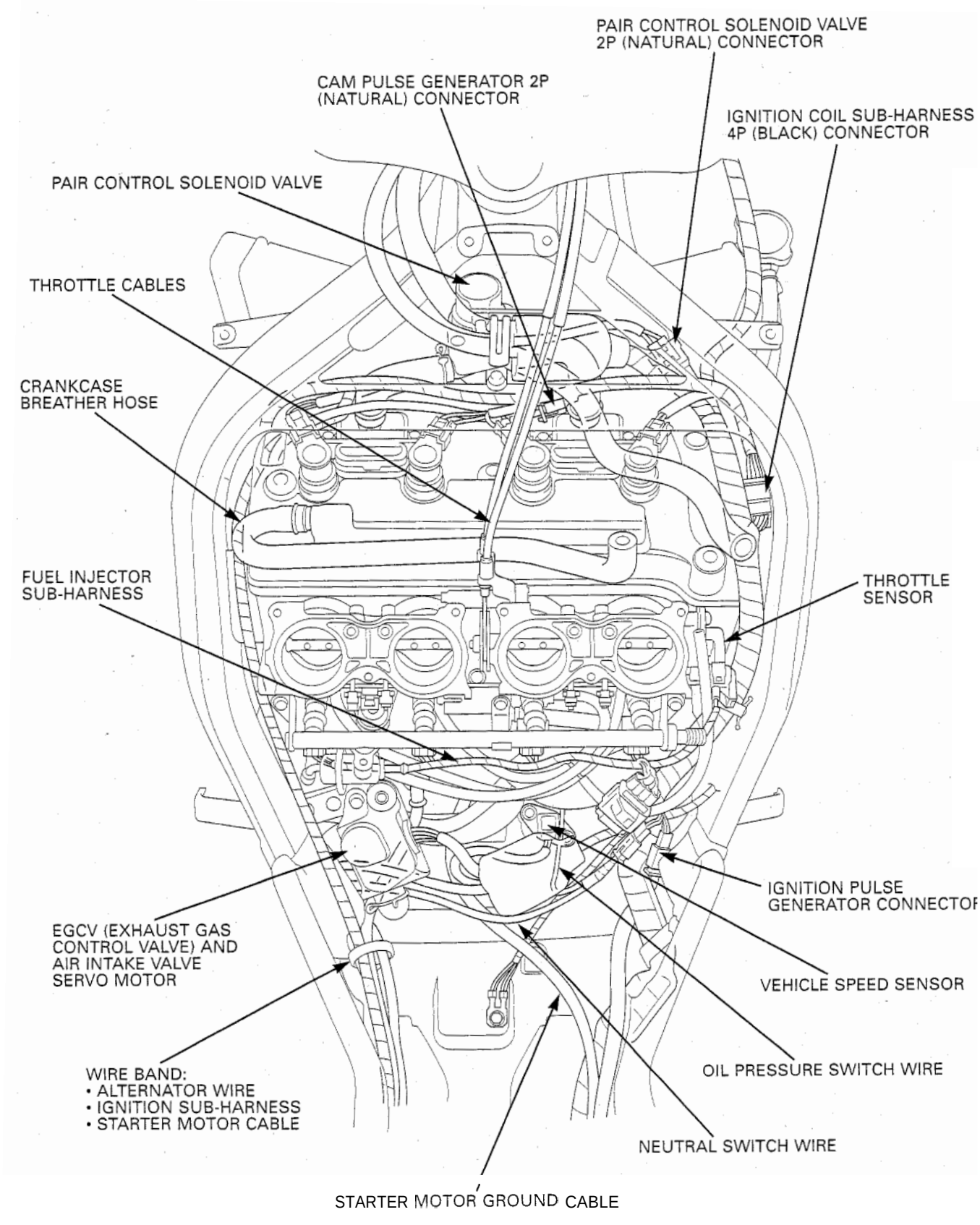



CLUTCH CABLE
LEFT HANDLEBAR SWITCH WIRE
MAIN WIRE HARNESS
HORN WIRE
FRONT BRAKE HOSE

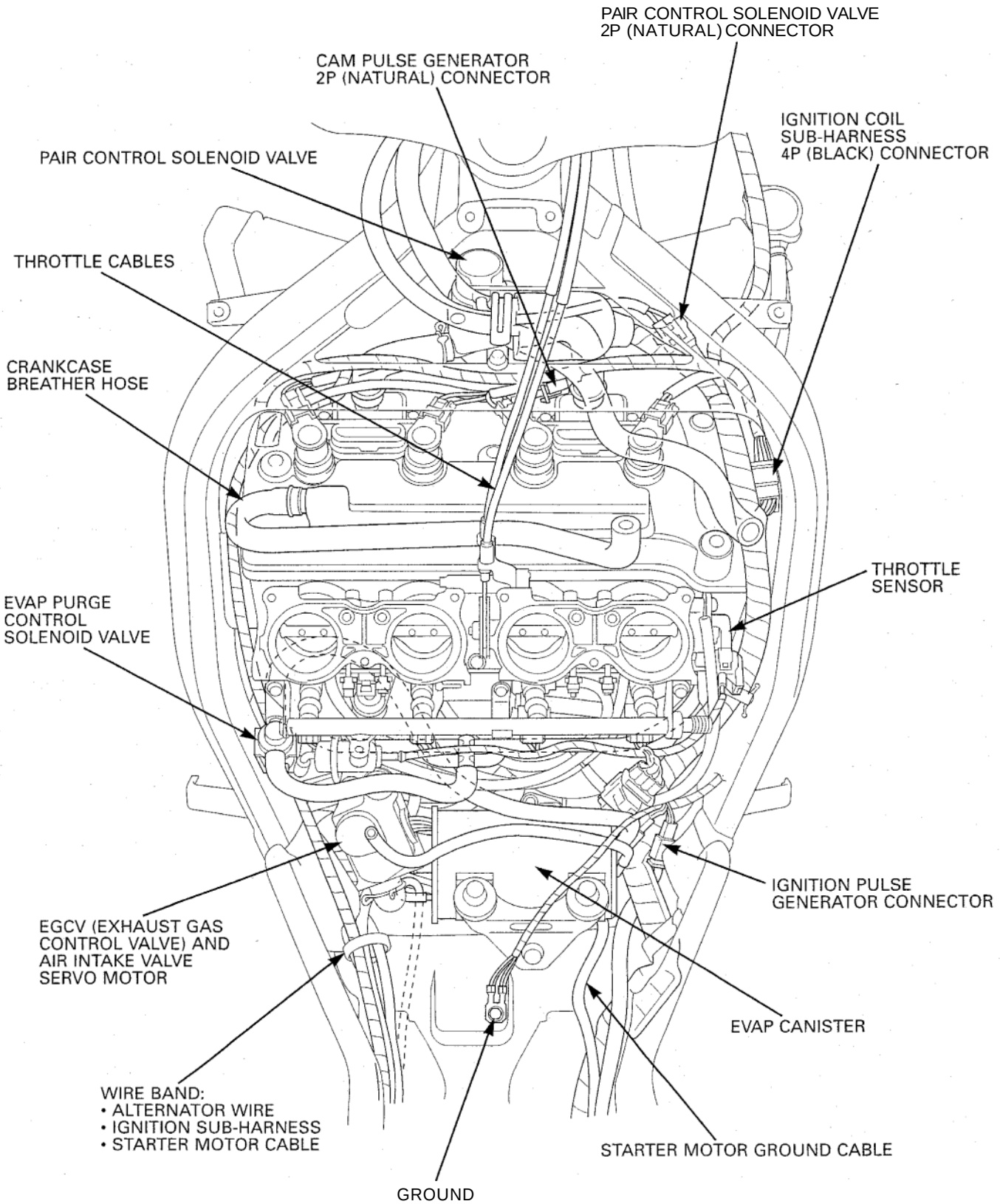

THROTTLE CABLES
RIGHT HANDLEBAR SWITCH WIRE
CLUTCH CABLE
WIRE BAND
FRONT SUB-HARNESS
FRONT BRAKE HOSE

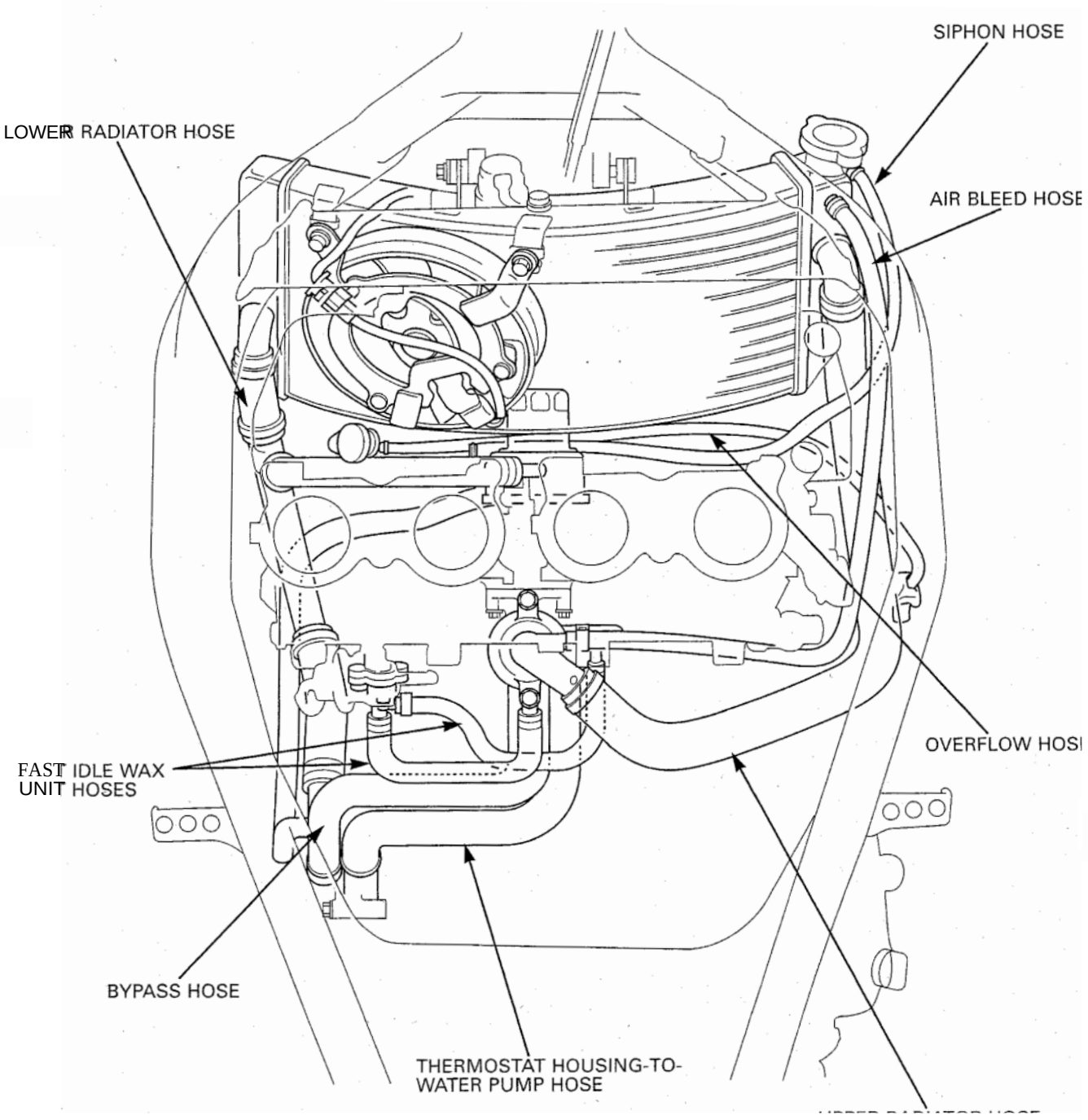

COMBINATION METER MULTI-CONNECTOR
FRONT SUB-HARNESS
HEADLIGHT CONNECTORS
MAIN WIRE HARNESS
SIPHON HOSE
RADIATOR AIR BLEED HOSE
CONNECTOR BOOT: FRONT SUB-HARNESS CONNECTORS (GRAY/BLUE)
THROTTLE CABLES
IGNITION SWITCH WIRE
CLUTCH CABLE
FRONT BRAKE HOSE
LEFT HANDLEBAR SWITCH WIRE

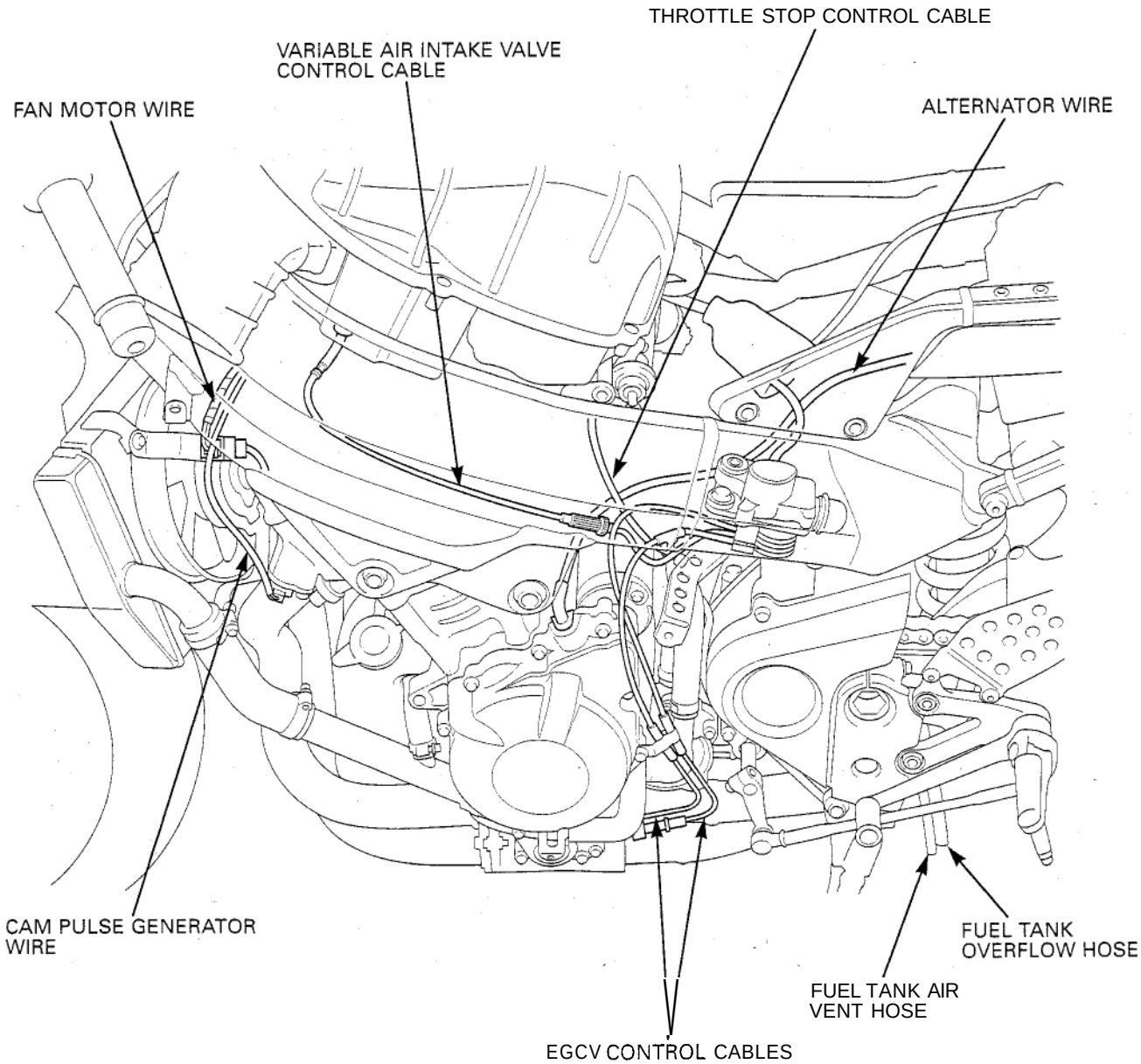
EXCEPT CALIFORNIA TYPE:

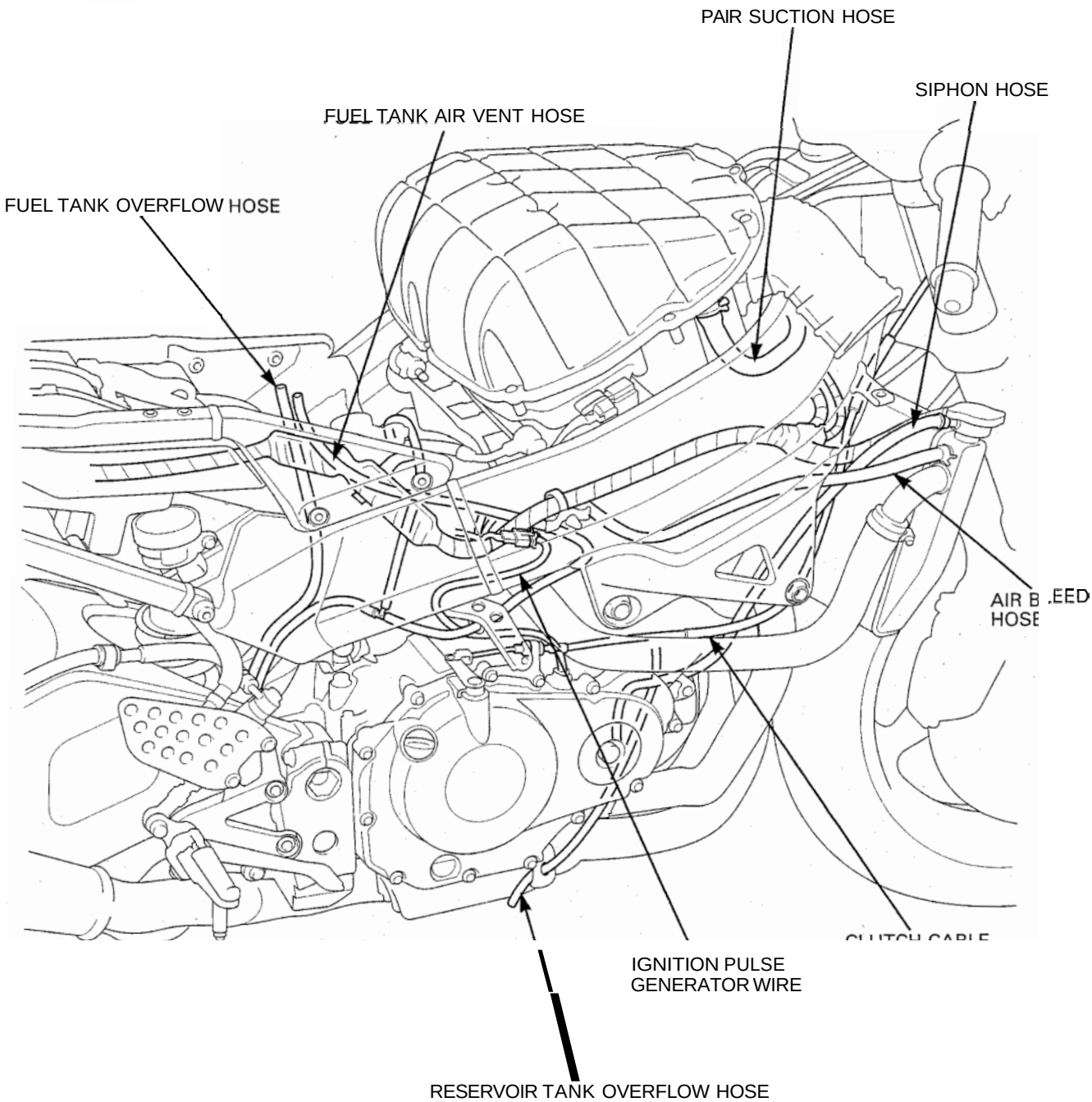


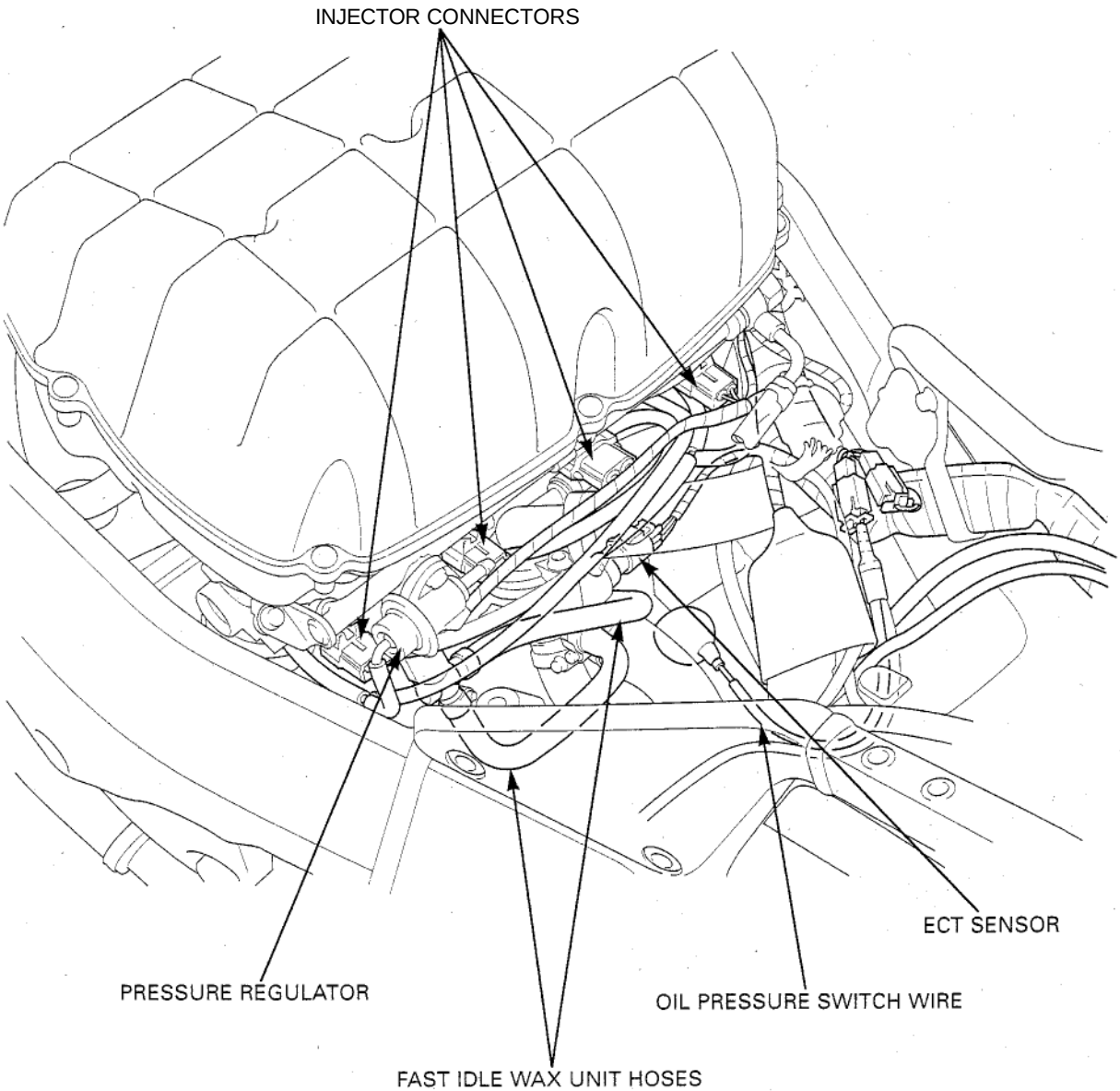
CALIFORNIA TYPE:

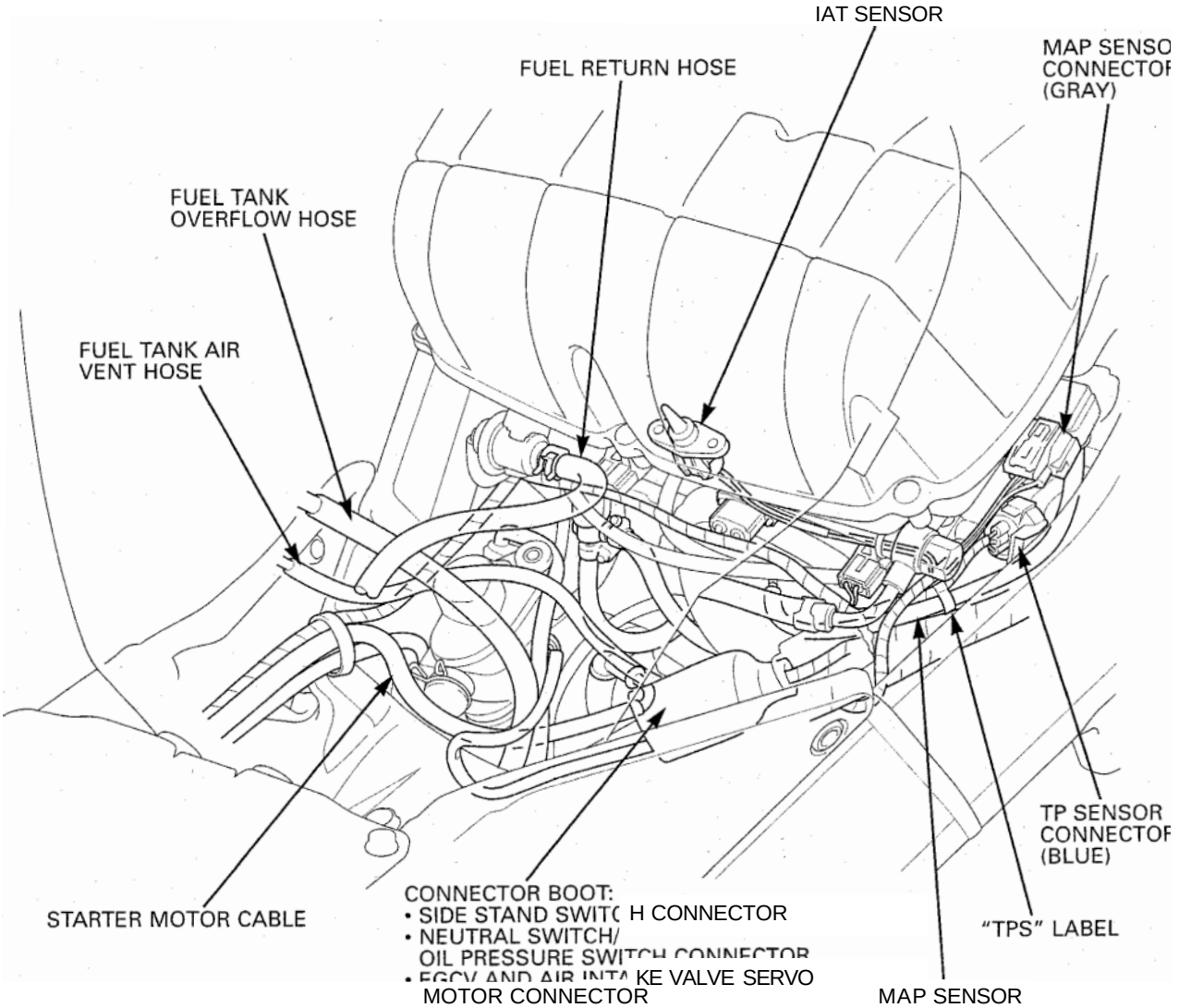


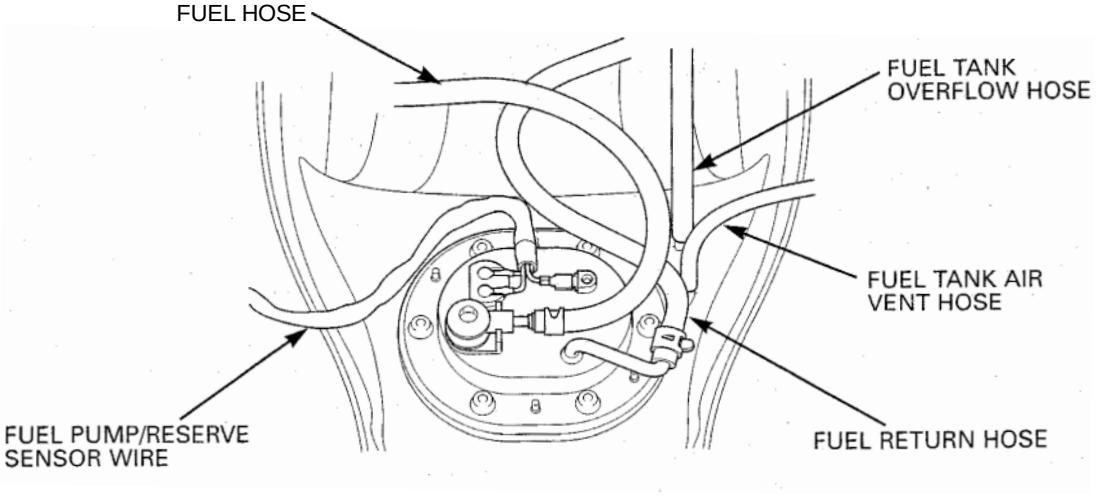

SIPHON HOSE
LOWER RADIATOR HOSE
AIR BLEED HOSE
OVERFLOW HOSE
FAST IDLE WAX UNIT HOSES
BYPASS HOSE
THERMOSTAT HOUSING-TO-WATER PUMP HOSE

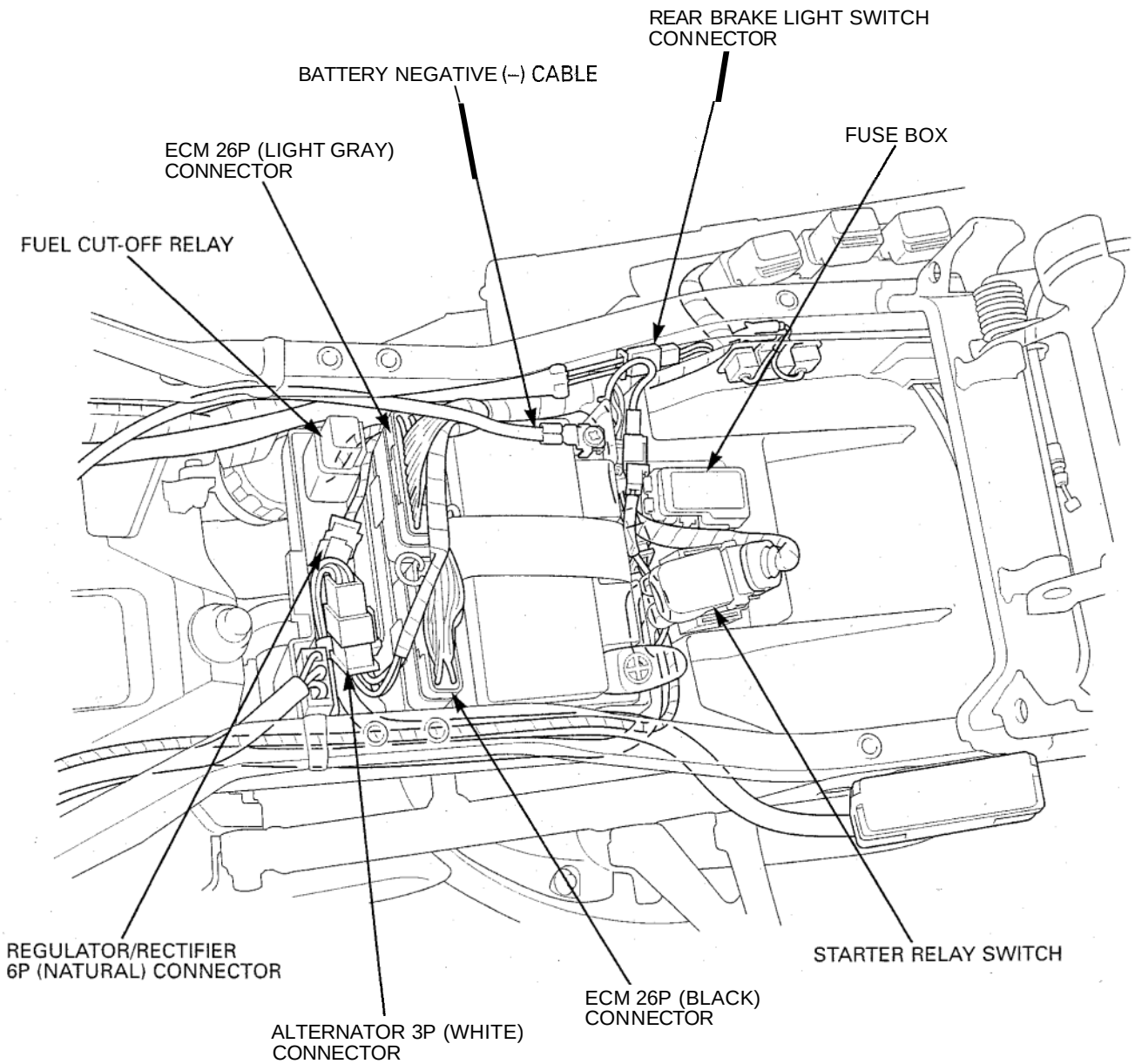

THROTTLE STOP CONTROL CABLE
VARIABLE AIR INTAKE VALVE CONTROL CABLE
FAN MOTOR WIRE
ALTERNATOR WIRE
CAM PULSE GENERATOR WIRE
FUEL TANK OVERFLOW HOSE
FUEL TANK AIR VENT HOSE
EGCV CONTROL CABLES

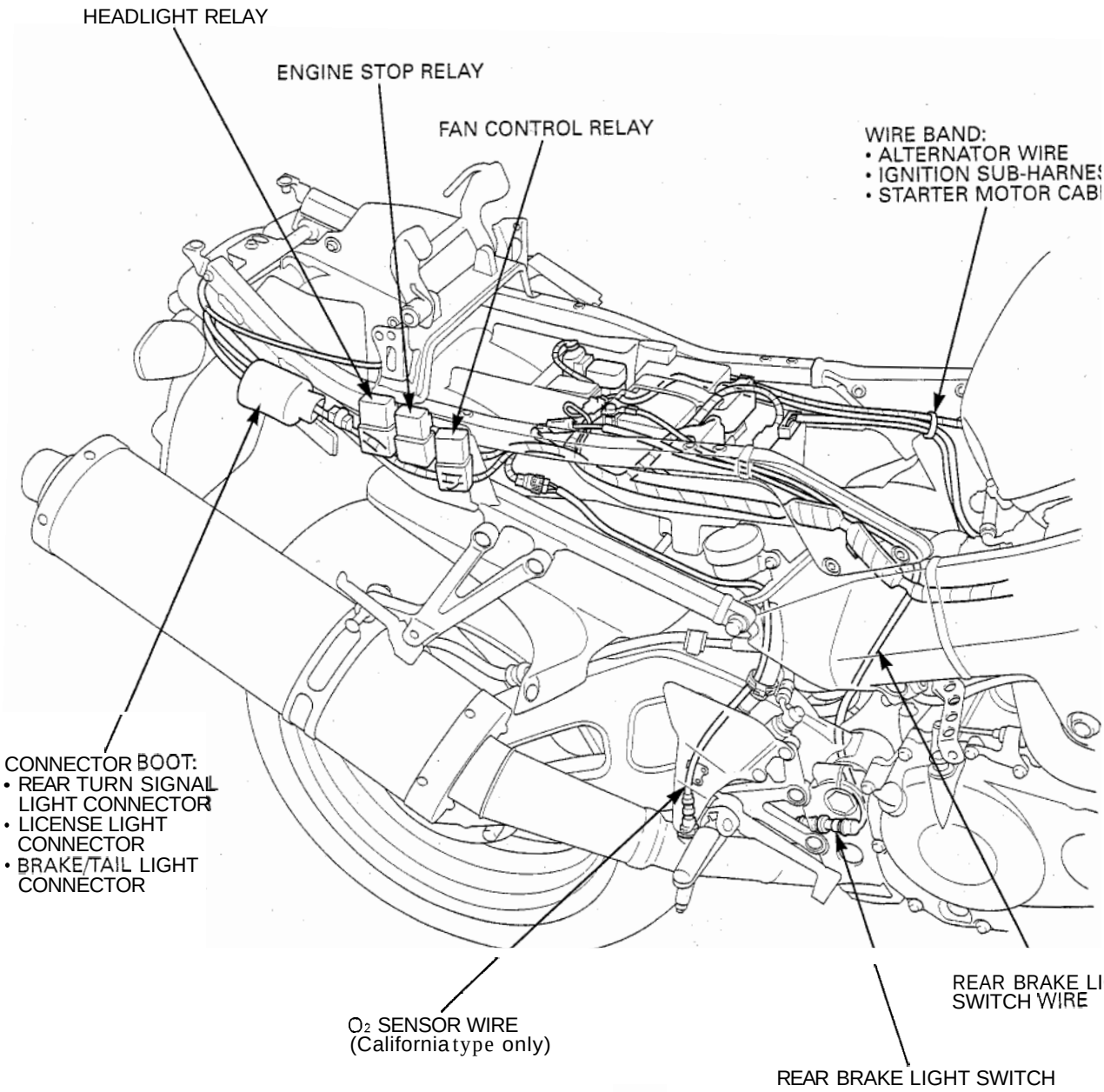

PAIR SUCTION HOSE
SIPHON HOSE
FUEL TANK AIR VENT HOSE
FUEL TANK OVERFLOW HOSE
AIR B .EED
HOSE
IGNITION PULSE
GENERATOR WIRE
RESERVOIR TANK OVERFLOW HOSE

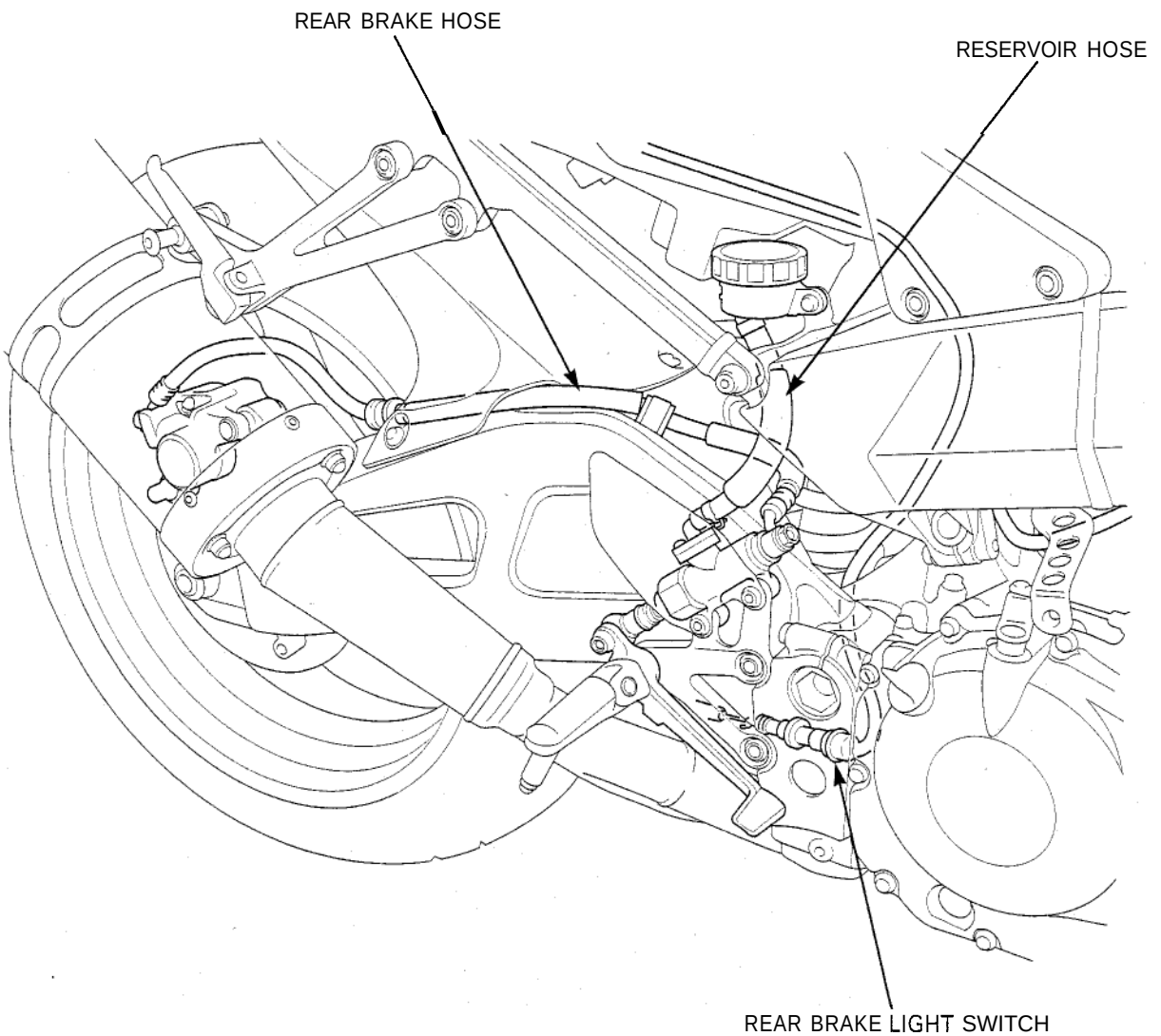

INJECTOR CONNECTORS
ECT SENSOR
PRESSURE REGULATOR
OIL PRESSURE SWITCH WIRE
FAST IDLE WAX UNIT HOSES


IAT SENSOR
FUEL RETURN HOSE
MAP SENSO
CONNECTOI
(GRAY)
FUEL TANK
OVERFLOW HOSE
FUEL TANK AIR
VENT HOSE
TP SENSOR
CONNECTOI
(BLUE)
STARTER MOTOR CABLE
CONNECTOR BOOT:
• SIDE STAND SWITC H CONNECTOR
• NEUTRAL SWITCH/
OIL PRESSURE SWITCH CONNECTOR
• EGCV AND AIR INTA KE VALVE SERVO
MOTOR CONNECTOR
• SPEED SENSOR
CONNECTOR
"TPS" LABEL
MAP SENSOR
VACUUM HOSE


FUEL HOSE
FUEL TANK
OVERFLOW HOSE
FUEL TANK AIR
VENT HOSE
FUEL PUMP/RESERVE
SENSOR WIRE
FUEL RETURN HOSE


REAR BRAKE LIGHT SWITCH CONNECTOR
BATTERY NEGATIVE (–) CABLE
FUSE BOX
ECM 26P (LIGHT GRAY) CONNECTOR
FUEL CUT-OFF RELAY
REGULATOR/RECTIFIER 6P (NATURAL) CONNECTOR
ALTERNATOR 3P (WHITE) CONNECTOR
ECM 26P (BLACK) CONNECTOR
STARTER RELAY SWITCH


HEADLIGHT RELAY
ENGINE STOP RELAY
FAN CONTROL RELAY
WIRE BAND:
• ALTERNATOR WIRE
• IGNITION SUB-HARNES
• STARTER MOTOR CABI
CONNECTOR BOOT:
• REAR TURN SIGNAL LIGHT CONNECTOR
• LICENSE LIGHT CONNECTOR
• BRAKE/TAIL LIGHT CONNECTOR
O2 SENSOR WIRE
(California type only)
REAR BRAKE LIGHT SWITCH WIRE
REAR BRAKE LIGHT SWITCH


REAR BRAKE HOSE
RESERVOIR HOSE
REAR BRAKE LIGHT SWITCH

EMISSION CONTROL SYSTEMS

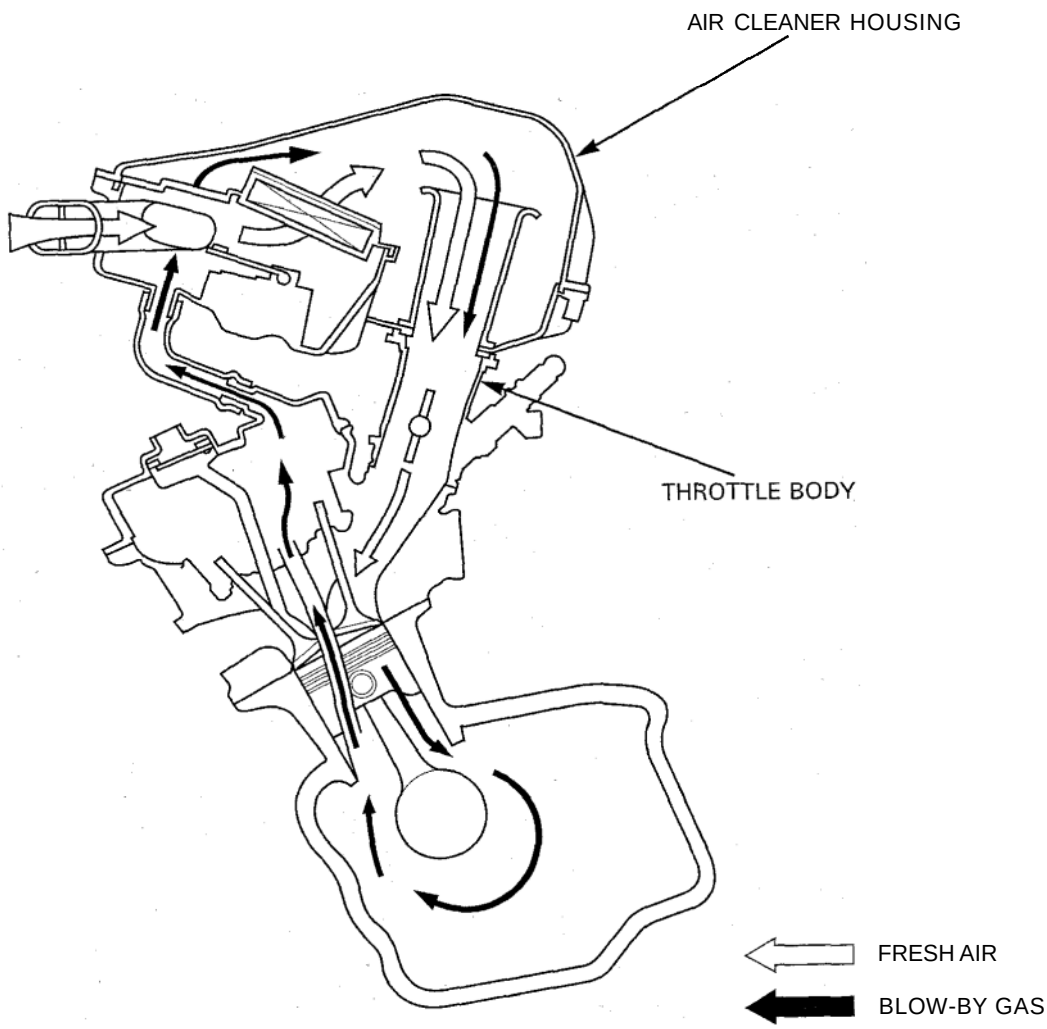
The U.S. Environmental Protection Agency, California Air Resources Board (CARB) and Transport Canada require manufacturers to certify that their motorcycles comply with applicable exhaust emissions standards during their useful life, when operated and maintained according to the instructions provided, and that motorcycles built after January 1, 1983 comply with applicable noise emission standards for one year or 6,000 km (3,730 miles) after the time of sale to the ultimate purchaser, when operated and maintained according to the instructions provided. Compliance with the terms of the Distributor's Limited Warranty for Honda Motorcycle Emission Control Systems is necessary in order to keep the emissions system warranty in effect.

SOURCE OF EMISSIONS

The combustion process produces carbon monoxide and hydrocarbons. Control of hydrocarbons is very important because, under certain conditions, they react to form photochemical smog when subjected to sunlight. Carbon monoxide does not react in the same way, but it is toxic.
Honda Motor Co., Ltd. utilizes lean injection settings as well as other systems, to reduce carbon monoxide and hydrocarbons.

CRANKCASE EMISSION CONTROL SYSTEM

The engine is equipped with a closed crankcase system to prevent discharging crankcase emissions into the atmosphere. Blow-by gas is returned to the combustion chamber through the air cleaner and throttle body.



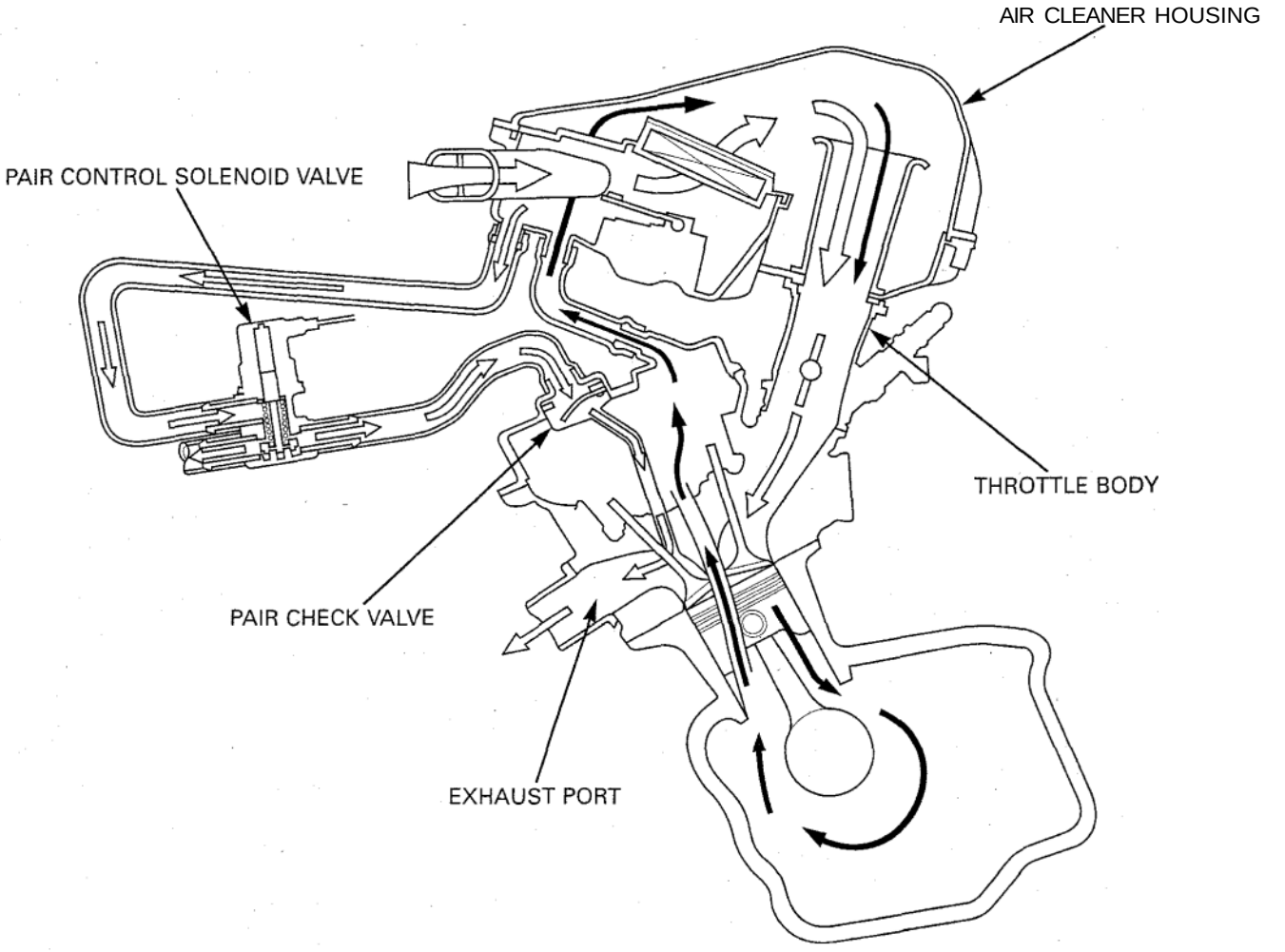
EXHAUST EMISSION CONTROL SYSTEM (SECONDARY AIR SUPPLY SYSTEM)

The exhaust emission control system is composed of a lean fuel injection setting, and no adjustments should be made except idle speed adjustment with the throttle stop screw. The exhaust emission control system is separate from the crankcase emission control system.

The exhaust emission control system also includes a secondary air supply system which introduces filtered air into the exhaust gases in the exhaust port. Fresh air is drawn into the exhaust port by the function of the PAIR (Pulse Secondary Air Injection) control valve.
This charge of fresh air promotes burning of the unburned exhaust gases and changes a considerable amount of hydrocarbons and carbon monoxide into relatively harmless carbon dioxide and water vapor.

The reed valve prevents reverse air flow through the system. The PAIR control valve is operated by the solenoid valve. The solenoid valve is controlled by the PGM-FI unit, and the fresh air passage is opened/closed according the running condition (ECT/IAT/TP/MAP sensor and engine revolution).

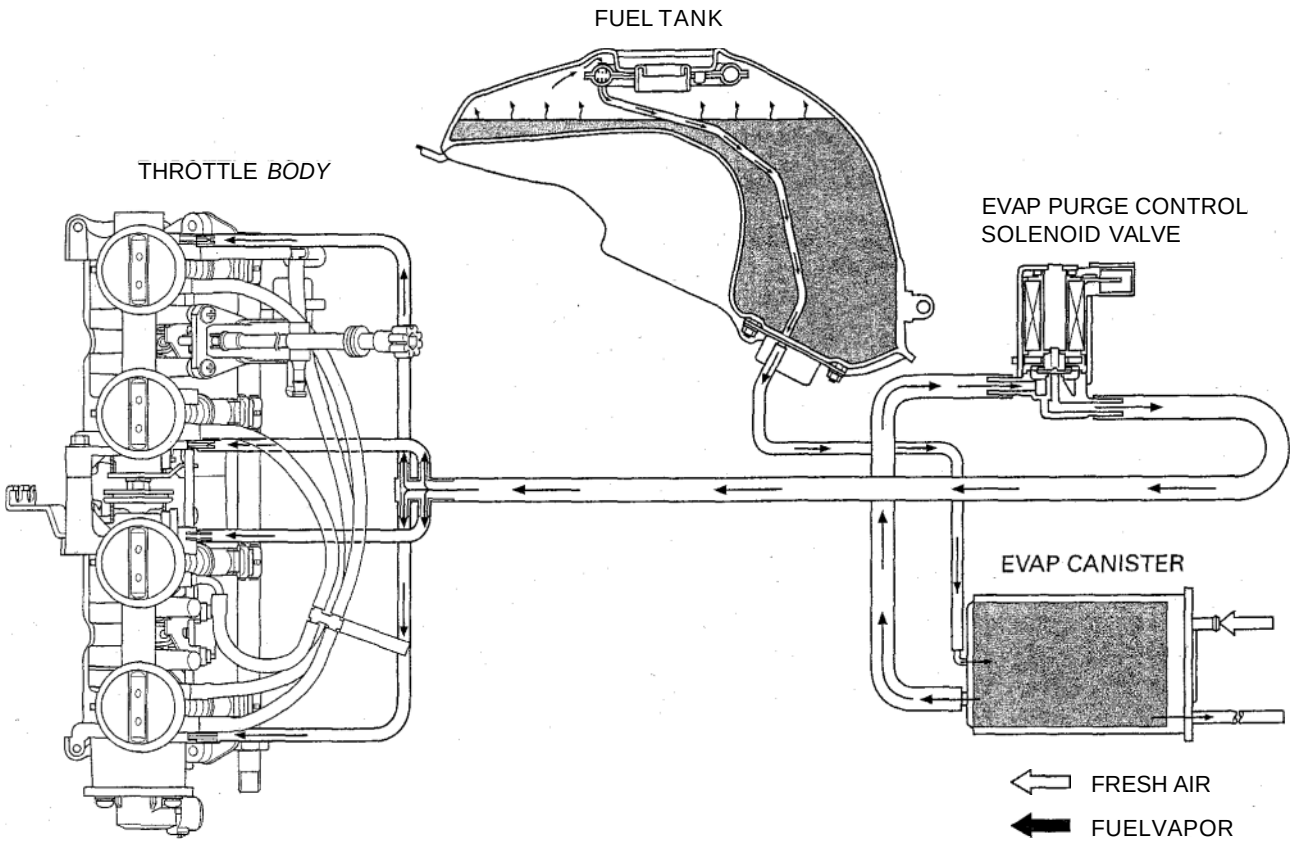
No adjustments to the secondary air supply system should be made, although periodic inspection of the components is recommended.



California type:
The California type is equipped with two three-way warm-up catalytic converters, a three-way catalytic converter, and a heated oxygen sensor.
The three-way catalytic converters are in the exhaust system. Through chemical reactions, they convert HC, CO, and NOx in the engine's exhaust to carbon dioxide (CO_2), dinitrogen (N_2), and water vapor.
No adjustment to these systems should be made although periodic inspection of the components is recommended.

EVAPORATIVE EMISSION CONTROL SYSTEM (CALIFORNIA TYPE ONLY)

This model complies with CARB evaporative emission requirements.
Fuel vapor from the fuel tank is routed into the evaporative emission (EVAP) canister where it is absorbed and stored while the engine is stopped. When the engine is running and the evaporative emission (EVAP) purge control solenoid valve is open, fuel vapor in the EVAP canister is drawn into the engine through the throttle body.



NOISE EMISSION CONTROL SYSTEM

TAMPERING WITH THE NOISE CONTROL SYSTEM IS PROHIBITED: U.S. Federal law prohibits, or Canadian provincial law prohibits the following acts or the causing there of: (1) The removal or rending inoperative by any person, other than for the purposes of maintenance, repair or replacement, of any device or element of design incorporated into any vehicle for the purpose of noise control prior to its sale or delivery to the ultimate customer or while it is in use; or (2) the use of any vehicle after such device or element of design has been removed or rendered inoperative by any person.

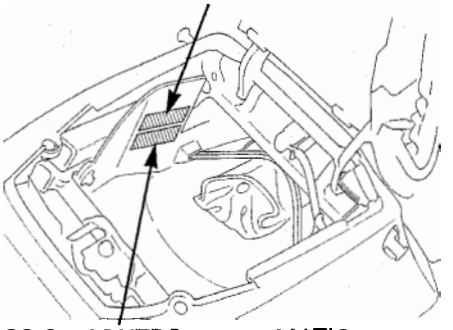
AMONG THOSE ACTS PRESUMED TO CONSTITUTE TAMPERING ARE THE ACTS LISTED BELOW:

1. Removal of, or puncturing of the muffler, baffles, header pipes or any other component which conducts exhaust gases.
2. Removal of, or puncturing of any part of the intake system.
3. Lack of proper maintenance.
4. Replacing any moving parts of the vehicle, or parts of the exhaust or intake system, with parts other then those specified by the manufacturer.

EMISSION CONTROL INFORMATION LABELS

An Emission Control Information Label is located on the storage compartment as shown.
The seat must be removed to read it.
It gives base tune-up specifications.

EMISSION CONTROL INFORMATION LABEL

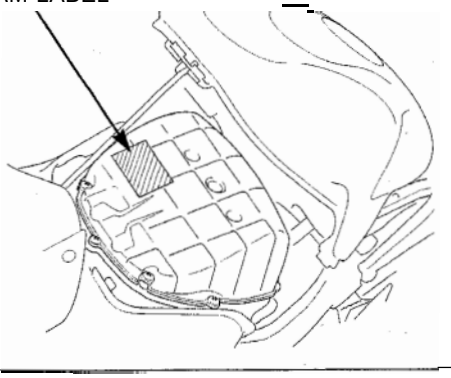


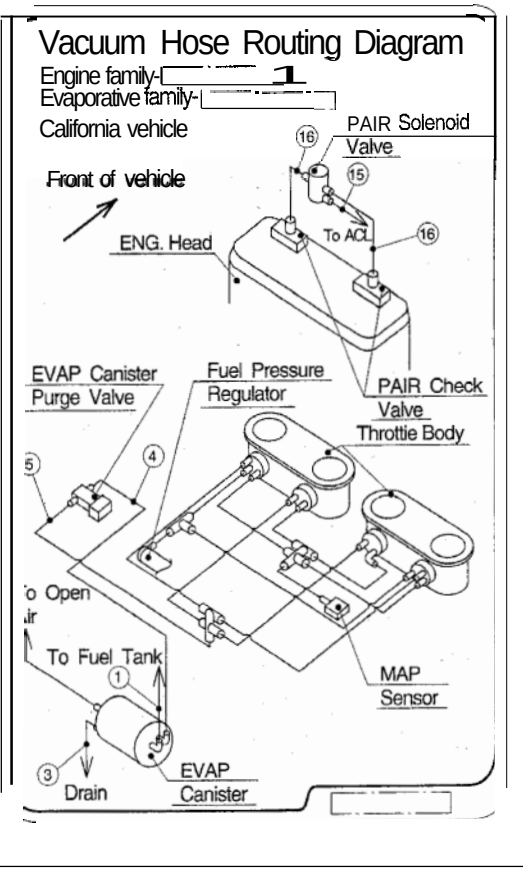
EMISSION CONTROL INFORMATION LABEL (Canada only)

VACUUM HOSE ROUTING DIAGRAM LABEL (CALIFORNIA TYPE ONLY)

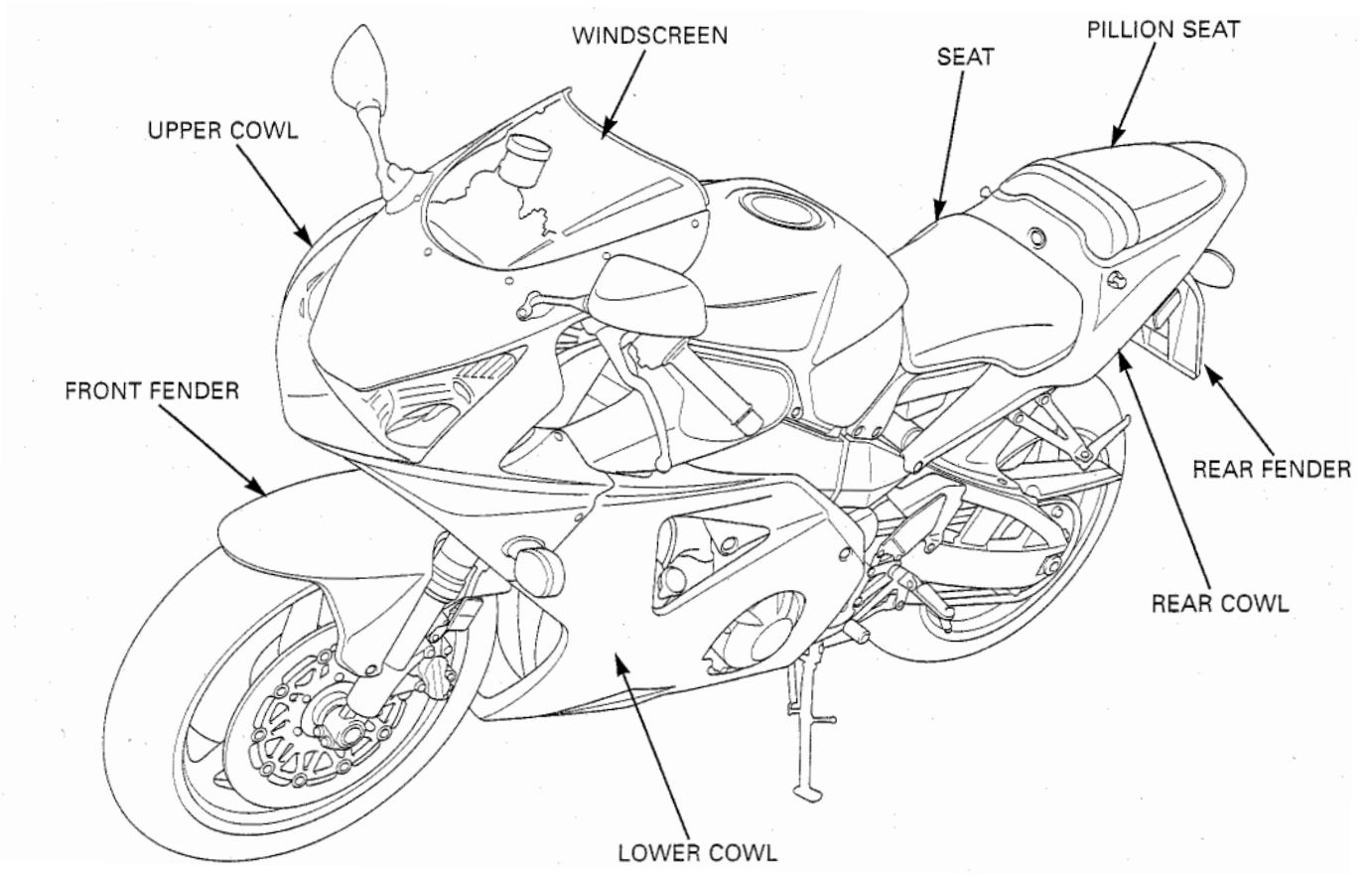
The Vacuum Hose Routing Diagram Label is on the air cleaner housing cover as shown.
The fuel tank must be opened to read it. Refer to page 3-4 for fuel tank opening.

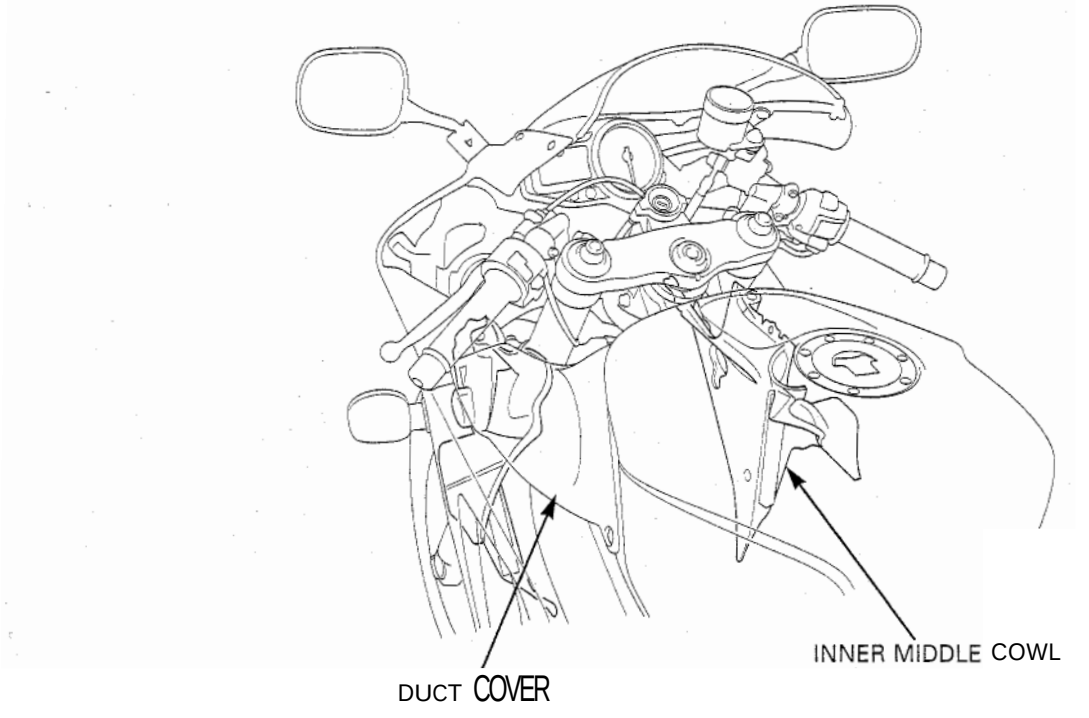
VACUUM HOSE ROUTING DIAGRAM LABEL





BODY PANEL LOCATIONS





2, FRAME/BODY PANEL EXHAUST SYSTEM

BODY PANEL LOCATIONS	2-0	LOWER COWL	2-7
SERVICE INFORMATION	2-1	INNER MIDDLE COWL	2-7
TROUBLESHOOTING	2-1	WINDSCREEN	2-8
SEAT	2-2	FRONT FENDER	2-8
PILLION SEAT/REAR COWL	2-2	REAR FENDER	2-9
DUCT COVER	2-4	SEAT RAIL	2-11
UPPER COWL	2-5	MUFFLER/EXHAUST PIPE	2-13

SERVICE INFORMATION

GENERAL

- This section covers removal and installation of the body panels and exhaust system.
- Always replace the exhaust pipe gaskets after removing the exhaust pipe from the engine.
- When installing the exhaust system, loosely install all of the exhaust pipe fasteners. Always tighten the exhaust clamps first, then tighten the mounting fasteners. If you tighten the mounting fasteners first, the exhaust pipe may not seat properly.
- Always inspect the exhaust system for leaks after installation.

TORQUE VALUES

Upper cowl pan screw	1.5 N*m (0.15 kgf•m, 1.1 lbf•ft)	
Lower cowl pan screw	1.5 N•m (0.15 kgf-m, 1.1 lbf•ft)	
Rear cowl truss screw	1.5 N•m (0.15 kgf-m, 1.1 lbf•ft)	
Pillion seat mounting nut	11 N•m (1.1 kgf•m, 8 lbf•ft)	U-nut
Pillion seat hinge special screw	12 N•m (1.2 kgf-m, 9 lbf•ft)	
Duct cover mounting screw	1.5 N•m (0.15 kgf-m, 1.1 lbf•ft)	
Windscreen mounting screw	0.3 N•m (0.03 kgf•m, 0.22 lbf•ft)	
Seat rail mounting bolt, 8 mm	39 N•m (4.0 kgf-m, 29 lbf•ft)	
Seat rail mounting nut, 10 mm	39 N•m (4.0 kgf•m, 29 lbf•ft)	
Pillion step mounting socket bolt	39 N•m (4.0 kgf•m, 29 lbf•ft)	
Exhaust pipe joint nut	12 N•m 1.2 kgf-m, 9 lbf•ft)	
EGCV cover mounting bolt	12 N•m 1.2 kgf•m, 9 lbf•ft)	
EGCV pulley cover mounting bolt	12 N•m 1.2 kgf-m, 9 lbf•ft)	

TROUBLESHOOTING

Excessive exhaust noise
- Broken exhaust system
- Exhaust gas leak

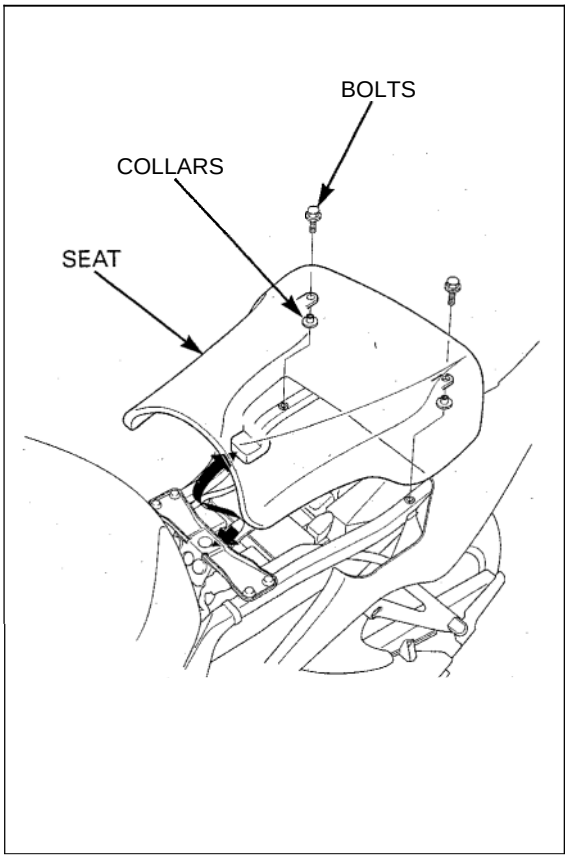
Poor performance
- Deformed exhaust system
- Exhaust gas leak
- Clogged muffler

SEAT

REMOVAL

Remove the two seat mounting bolts behind the seat.

Slide the seat back and then off.
Remove the mounting collars.



INSTALLATION

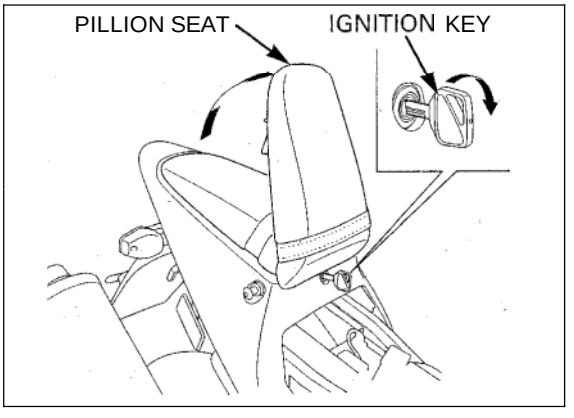
Install the collars into the seat bottom plate as shown.
Align the seat hook with the fuel tank rear bracket and install the seat.
Install and tighten the bolts securely.

PILLION SEAT/REAR COWL

REMOVAL

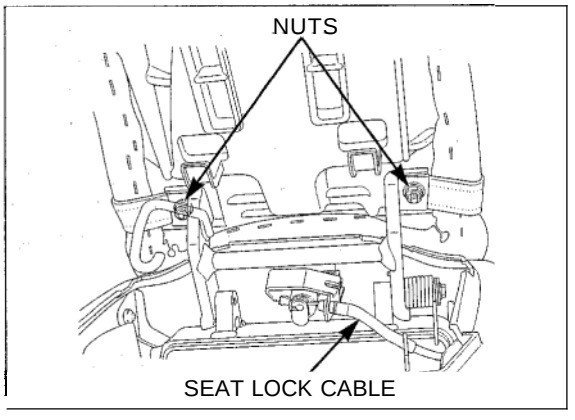
Remove the seat (see above).

Open the pillion seat using the ignition key.



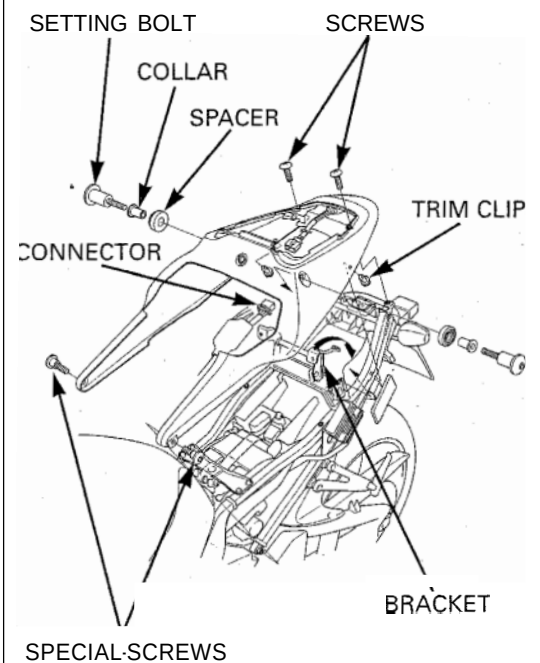
Remove the pillion seat mounting nuts, then remove the seat belt and pillion seat.

Disconnect the seat lock cable from the key cylinder.

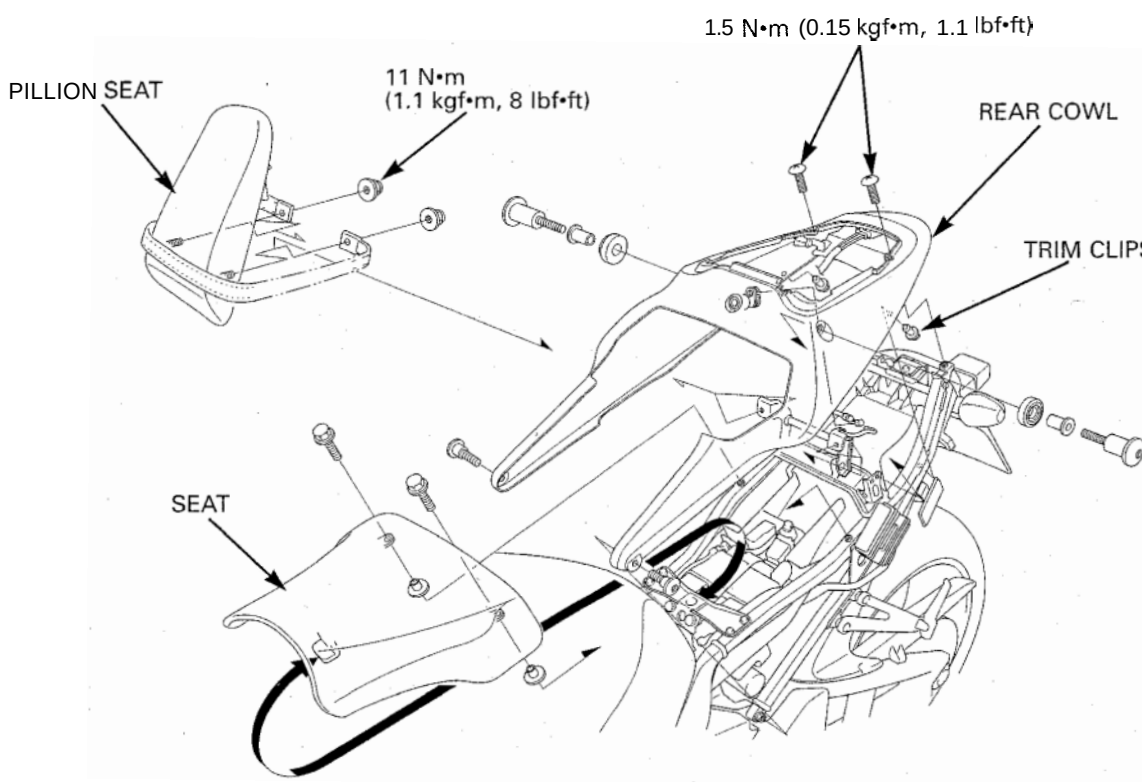


Remove the two trim clips.
Remove the screws, special screws, setting bolts, collars and spacers.
Push down the pillion seat mounting bracket and carefully spread the bottom of both sides of the rear cowl, then remove it from the seat rail.

Disconnect the tail light connector.



INSTALLATION

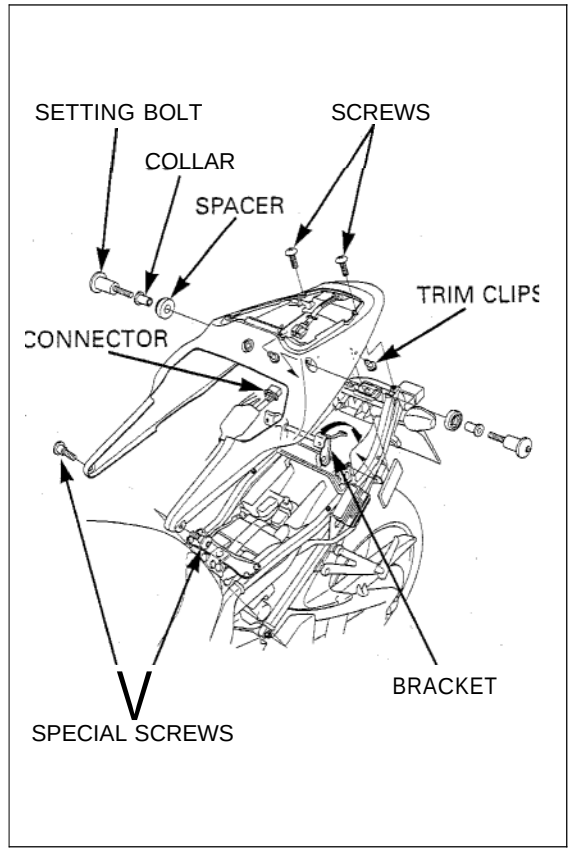


Connect the tail light connector.
Install the rear cowl over the seat rail being careful not to damage the wire harness.

Install the spacers, setting collars and setting bolts.
Install the special screws and truss screws.
Install the trim clips.

Tighten the setting bolts and special screws securely.
Tighten the screws to the specified torque.

TORQUE:
Rear cowl truss screw:
1.5 N•m (0.15 kgf•m, 1.1 lbf•ft)



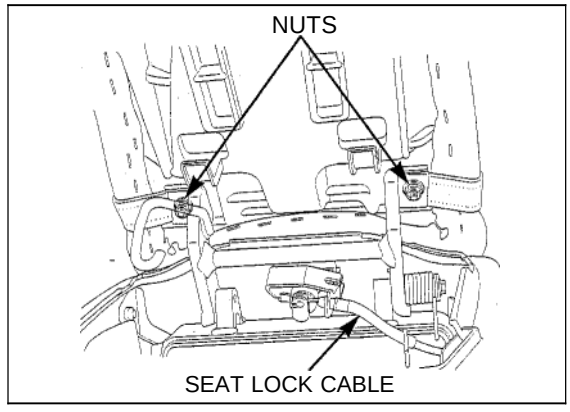
Connect the seat lock cable to the key cylinder.

Install the pillion seat and nuts to the pillion seat bracket.

Tighten the nuts to the specified torque.

TORQUE: 11 N•m (1.1 kgf•m, 8 lbf•ft)

Push the pillion seat down to lock it.



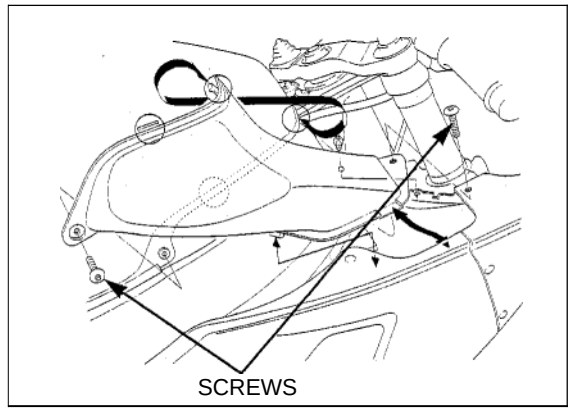
DUCT COVER

REMOVAL/INSTALLATION

Remove the screws.
Release the tab of the duct cover from the fuel tank, then remove the duct cover.

Installation is in the reverse order of removal.

TORQUE: 1.5 N•m (0.15 kgf•m, 1.1 lbf*ft)

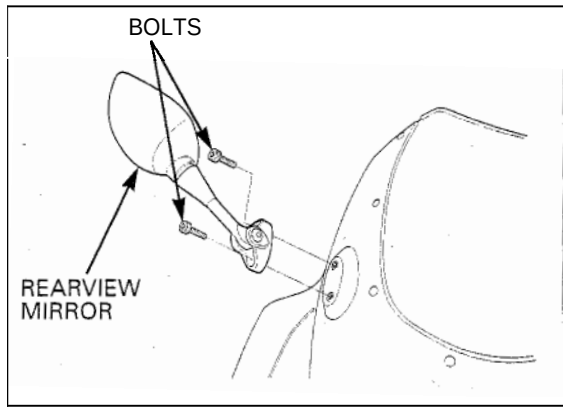


UPPER COWL

REMOVAL

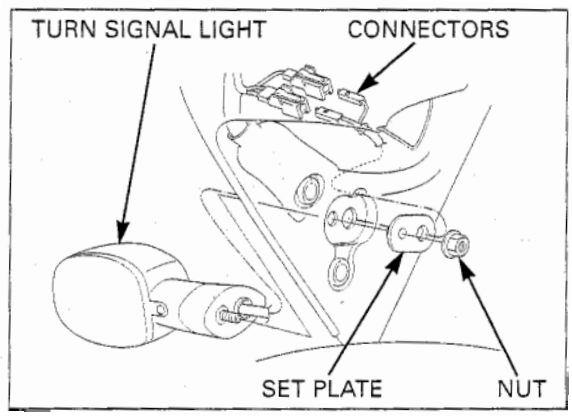
Remove the duct cover (page 2-4).

Remove the socket bolts and rearview mirrors.



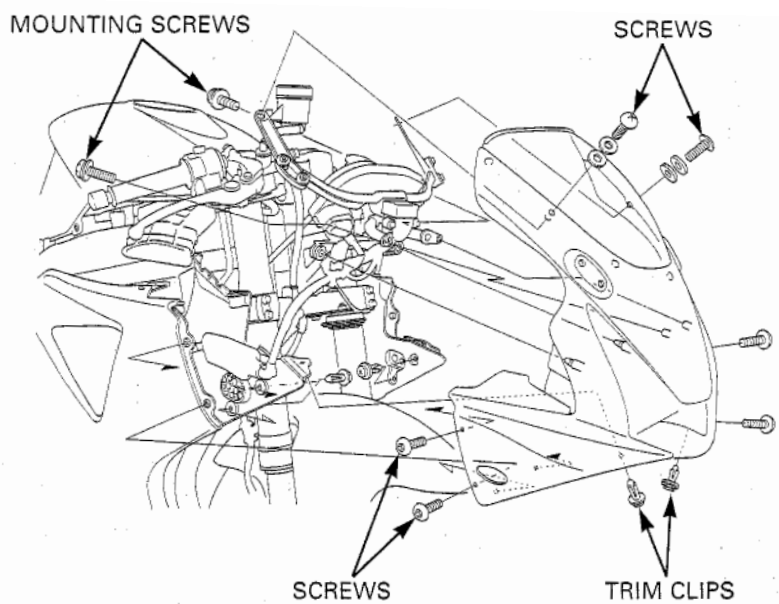
Disconnect the turn signal light connectors.

Remove the nuts, set plates and turn signal lights from the inner middle cowl.

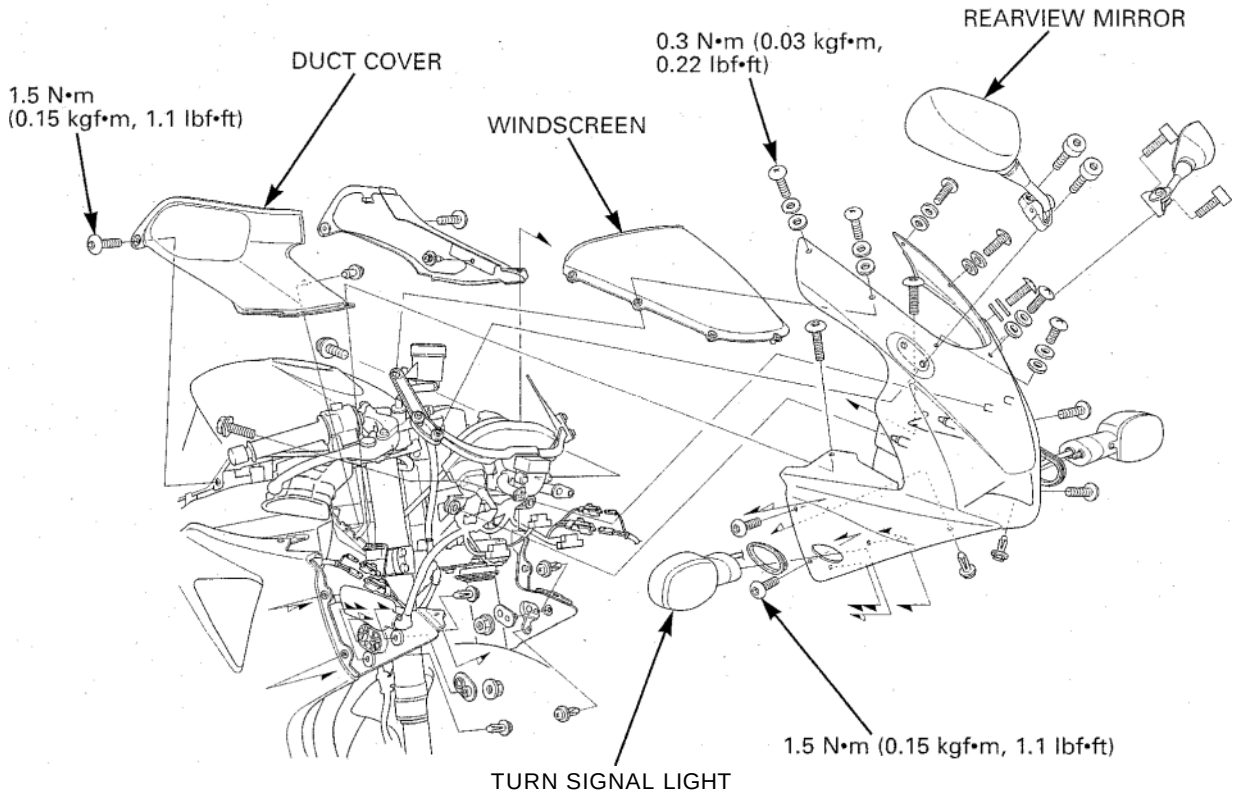


Remove the trim clips.
Remove the windscreen-to-upper cowl bracket screws.
Remove the upper cowl-to-lower cowl screws.
Remove the upper cowl mounting screws.

Pull the upper cowl forward.
Disconnect the headlight connectors, then remove the upper cowl.



INSTALLATION

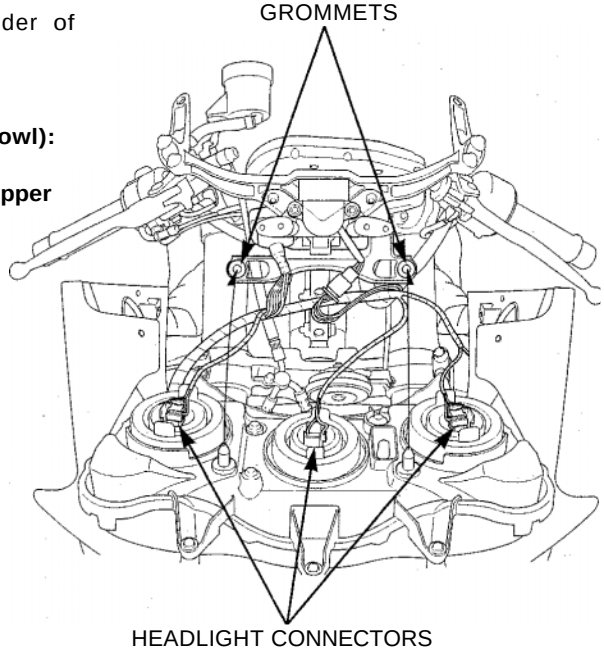


Connect the headlight connectors to the headlight sockets on the upper cowl.

Install the upper cowl onto the upper cowl stay while aligning the headlight unit bosses with the upper cowl stay grommets.

Install the removed parts in the reverse order of removal.

TORQUE:
Upper cowl pan screw (upper cowl-to-lower cowl):
1.5 N•m (0.15 kgf•m, 1.1 lbf•ft)
Windscreen mounting screw (windscreen-to-upper cowl bracket):
0.3 N•m (0.03 kgf•m, 0.22 **lbf•ft)**



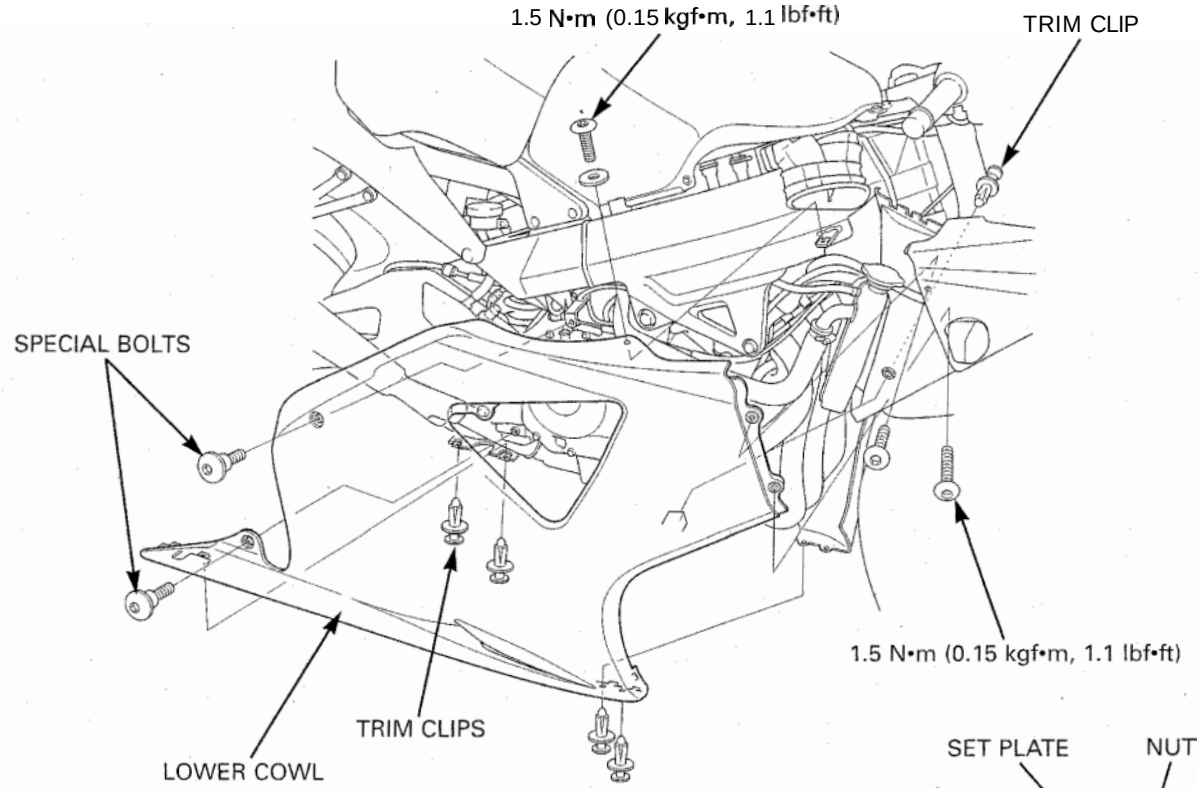
LOWER COWL

REMOVAL/INSTALLATION

Remove the trim clip from the inner middle cowl.
Remove the four trim clips from the lower cowl.
Remove the upper cowl-to-lower cowl screws.
Remove the lower cowl mounting screw, special bolts and then remove the lower cowl.

Installation is in the reverse order of removal.

TORQUE:
Lower cowl pan screw:
1.5 N•m (0.15 kgf•m, 1.1 lbf•ft)



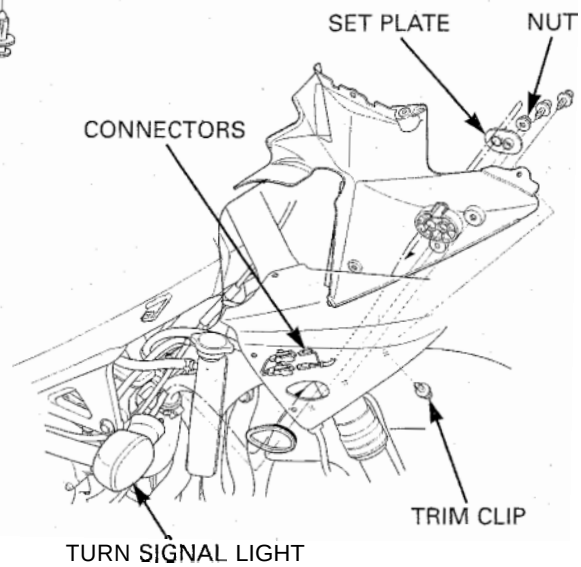
INNER MIDDLE COWL

REMOVAL/INSTALLATION

Remove the lower cowl (see above).

Disconnect the turn signal light connectors.
Remove the trim clips.
Remove the nut, set plate and turn signal light.
Remove the inner middle cowl.

Installation is in the reverse order of removal.



WINDSCREEN

REMOVAL/INSTALLATION

Remove the rearview mirrors (page 2-5).

Remove the screws, nylon washers and rubber washers.
Remove the windscreen by pulling out the setting nuts from the upper cowl bracket.

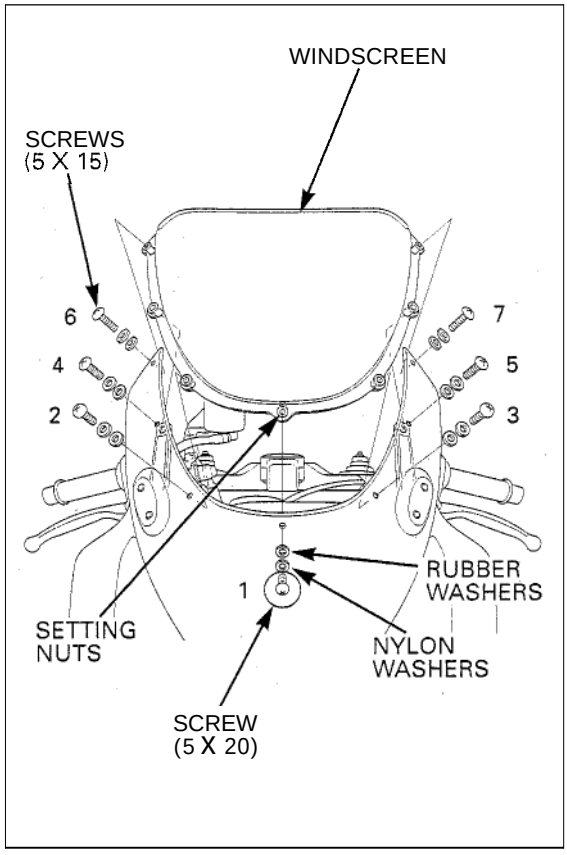
NOTICE

Windscreen mounting fasteners are plastic screws. Do not overtighten the screws.

'Tighten the screws in numerical order as shown in the illustration

Installation is in the reverse order of removal.

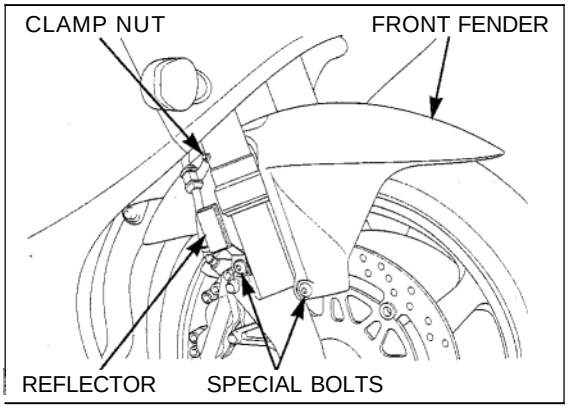
TORQUE: 0.3 N·m (0.03kgf·m, 0.22lbf·ft)



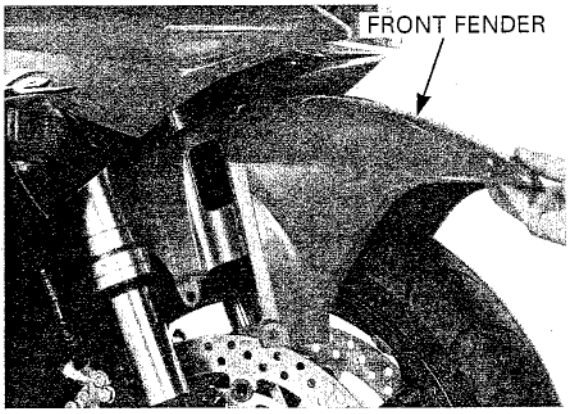
FRONT FENDER

REMOVAL

Remove the brake hose clamp mounting nuts.
Remove the front fender mounting special bolts and reflectors.



Remove the front fender by pulling it forward.



INSTALLATION

Installation is in the reverse order of removal.

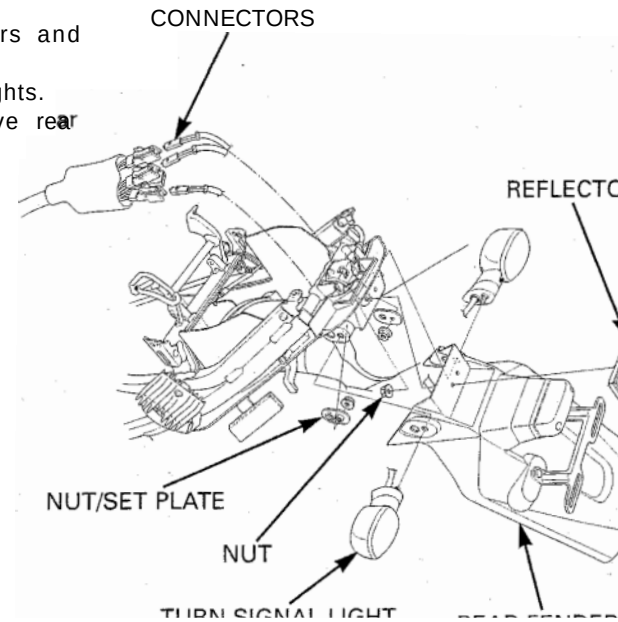
REAR FENDER

REAR FENDER A REMOVAL/ INSTALLATION

Remove the rear cowl (page 2-2).

Disconnect the turn signal light connectors and license light connector.
Remove the nuts, set plates and turn signal lights.
Remove the nut and reflector, then remove rear fender A.

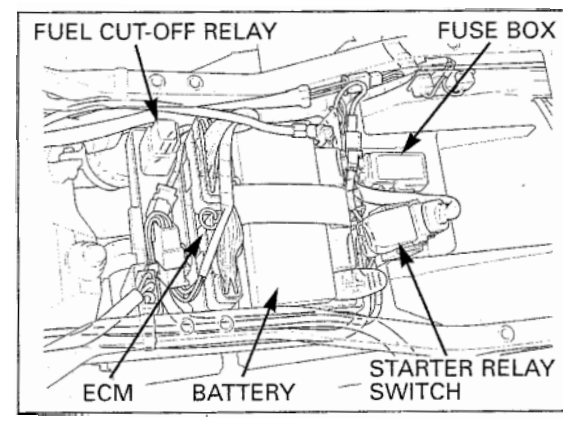
Installation is in the reverse order of removal.



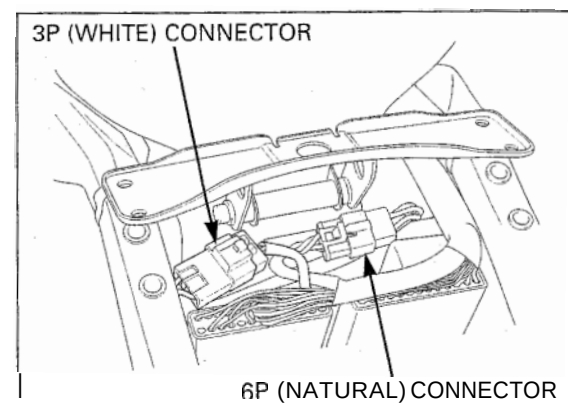
REAR FENDER REMOVAL

Remove the following:
- Rear cowl (page 2-2)
- Battery (page 16-4)
- ECM (page 5-87)

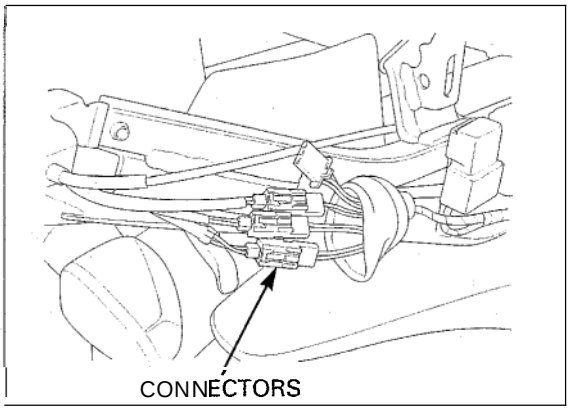
Unhook the retaining tab and remove the fuse box.
Remove the starter relay switch and fuel cut-off relay from the rear fender.



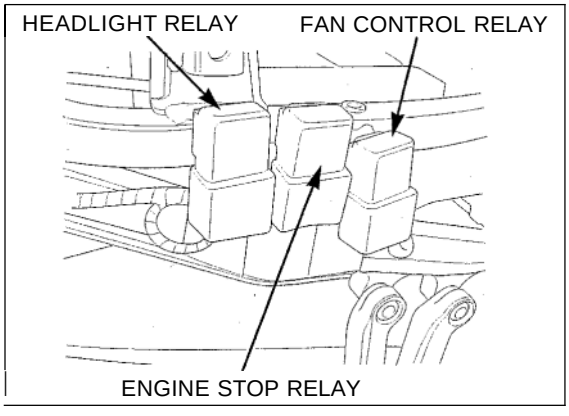
Disconnect the alternator 3P (White) connector and regulator/rectifier 6P (Natural) connector.



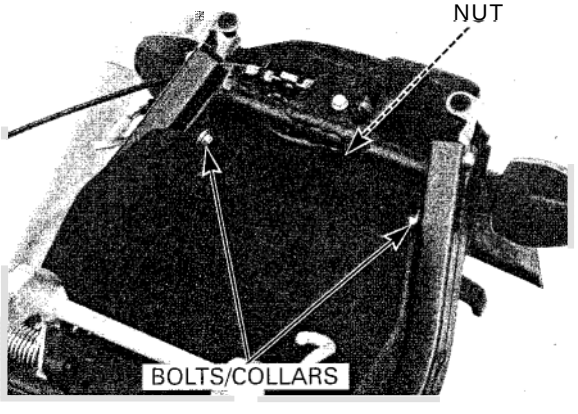
Disconnect the turn signal connectors and license light connector.



Remove the headlight relay, engine stop relay and fan control relay from the rear fender.

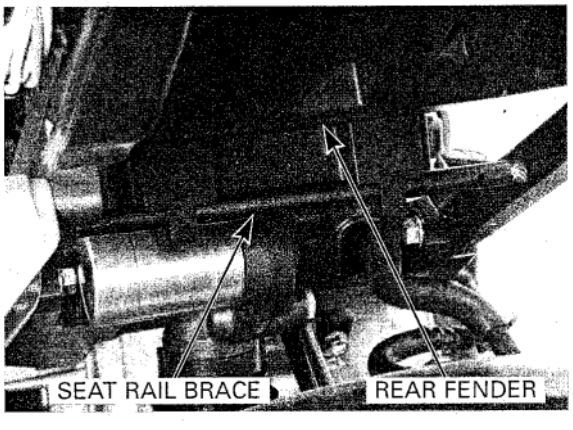


Remove the reflector mounting nut.
Remove the two rear fender mounting bolts and collars.

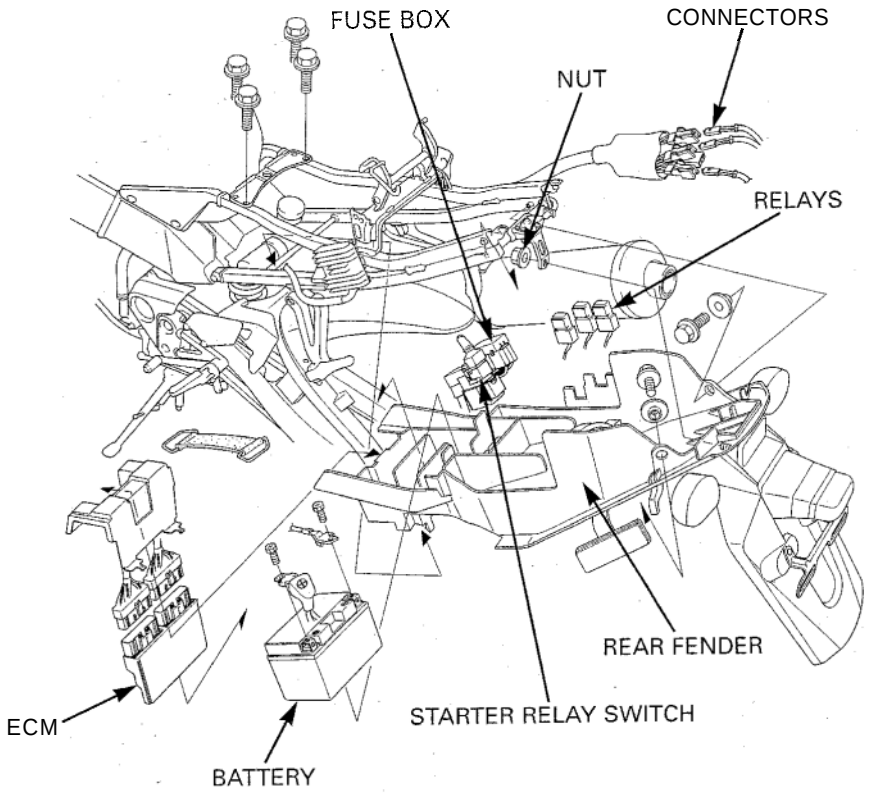


Unhook the rear fender from the seat rail brace, then release the regulator/rectifier wire and main wire harness from the seat rail and rear fender.

Remove the rear fender by pulling it backward.



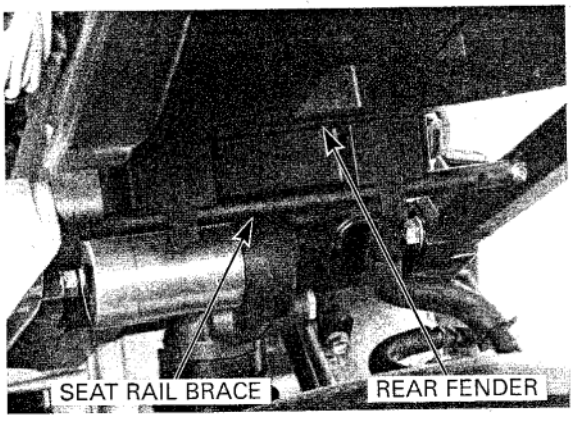
REAR FENDER INSTALLATION



Install the rear fender aligning its lower groove with the seat rail brace.

Connect the license light connector and turn signal connectors.

Install the removed parts in the reverse order of removal.

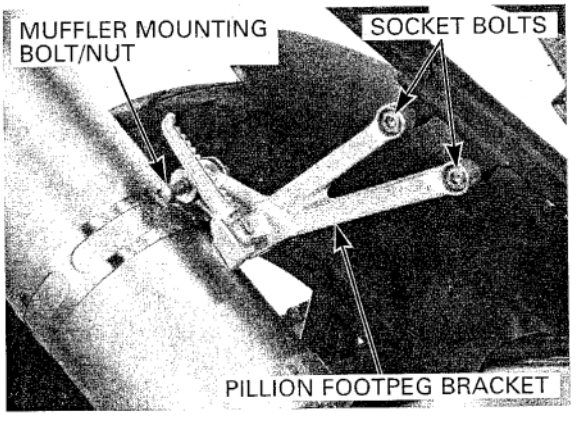


SEAT RAIL

REMOVAL

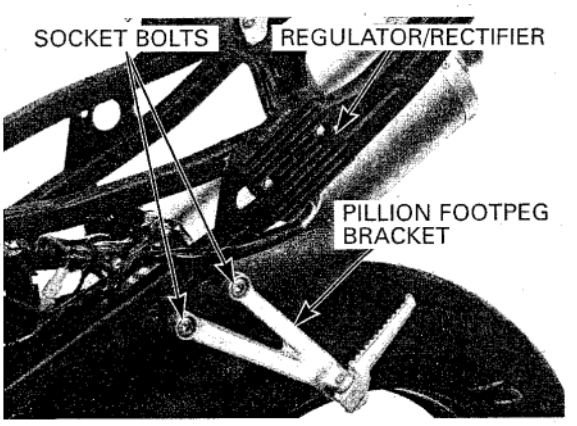
Remove the rear fender (page 2-9).

Remove the muffler mounting bolt/nut.
Remove the socket bolts and right pillion footpeg bracket.

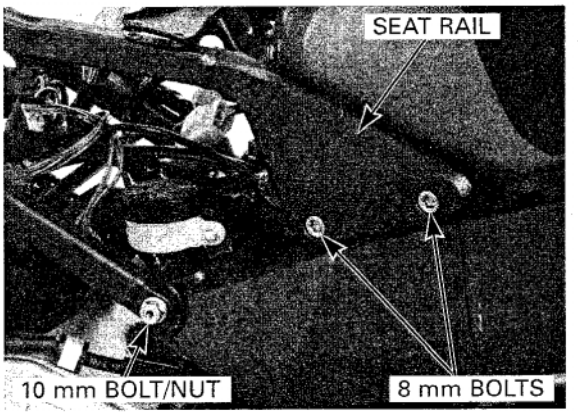


Remove the socket bolts and left pillion footpeg bracket.

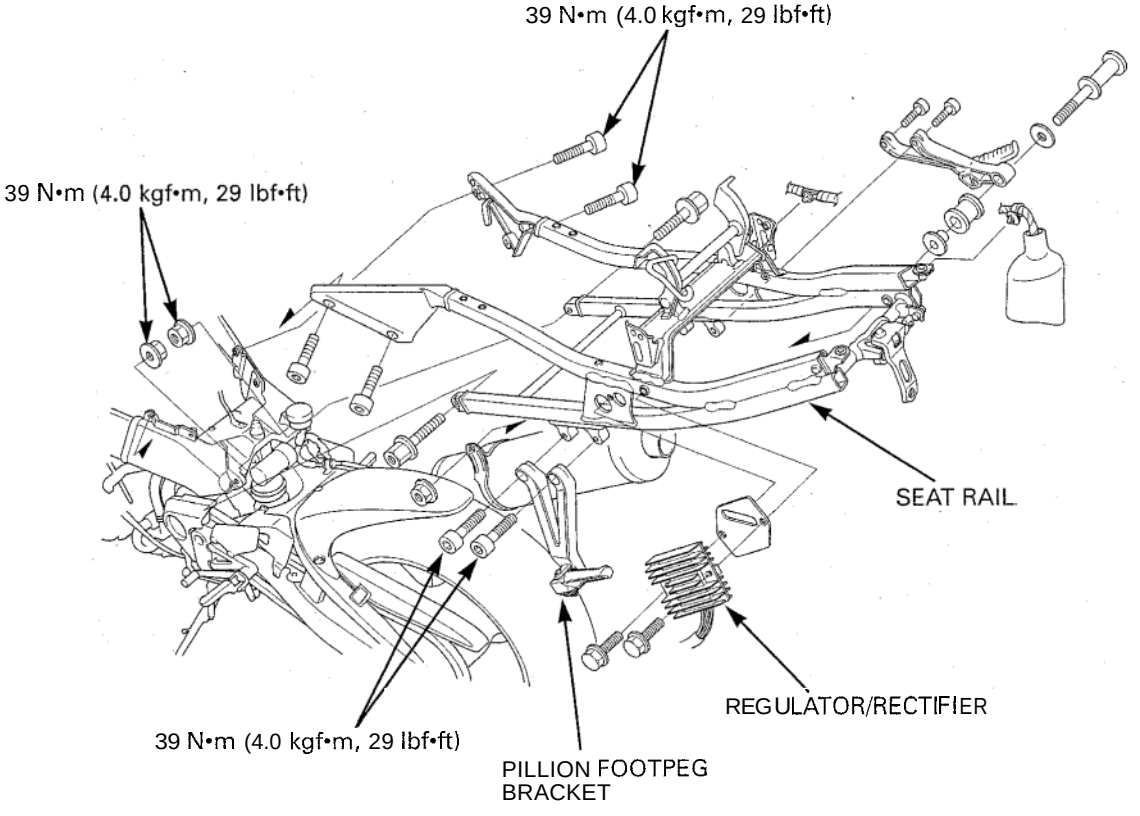
Remove the bolts and regulator/rectifier.



Remove the fuel tank rear bracket bolts.
Remove the seat rail mounting 8 mm bolts, 10 mm bolts/nuts and seat rail.

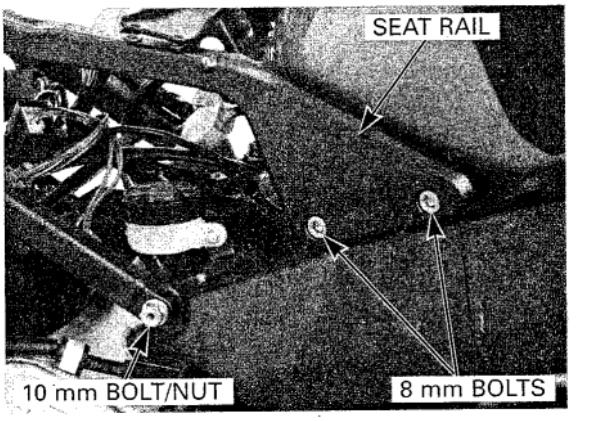


INSTALLATION



Install the seat rail and tighten the mounting bolts and nuts to the specified torque.

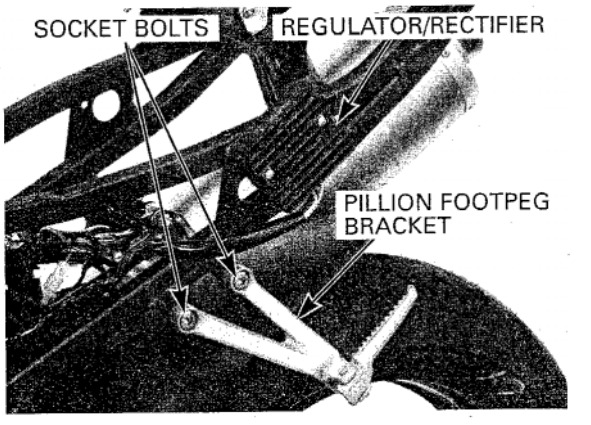
TORQUE:
8 mm bolt: 39 N·m (4.0 kgf·m, 29 lbf·ft)
10 mm nut: 39 N·m (4.0 kgf·m, 29 lbf·ft)



Install the regulator/rectifier, tighten the bolts.

Install the left pillion footpeg bracket and tighten the socket bolts to the specified torque.

TORQUE: 39 N·m (4.0 kgf·m, 29 lbf·ft)

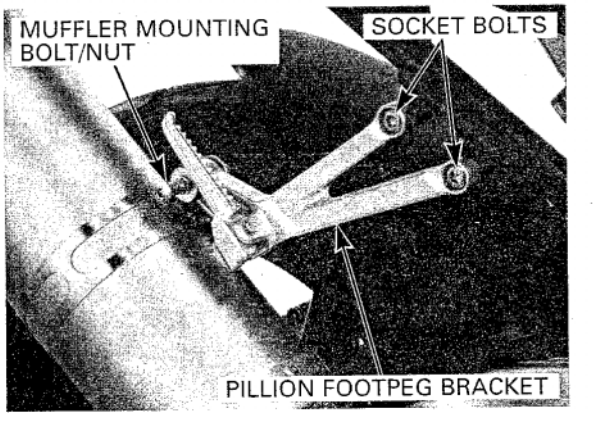


Install the right pillion footpeg bracket and tighten the socket bolts to the specified torque.

TORQUE: 39 N·m (4.0 kgf·m, 29 lbf·ft)

Install the muffler mounting bolt, washer and nut, and tighten the nut securely.

Install the removed parts in the reverse order of removal.



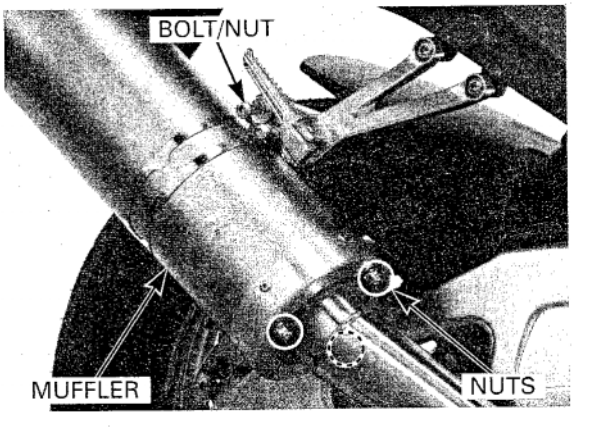
MUFFLER/EXHAUST PIPE

REMOVAL

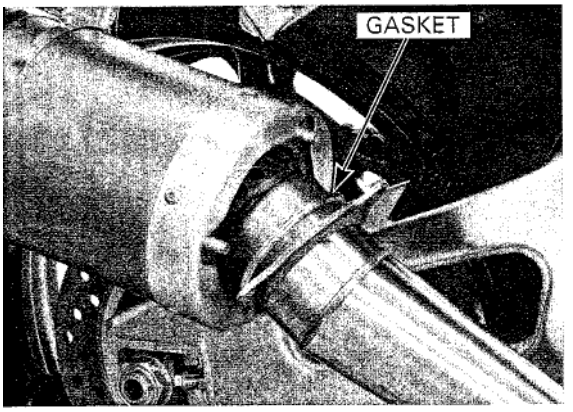
Do not service the exhaust system while it is hot.

Remove the lower cowl (page 2-7).

Remove the exhaust pipe-to-muffler joint nuts.
Remove the muffler mounting bolt/nut and washer, then remove the muffler.

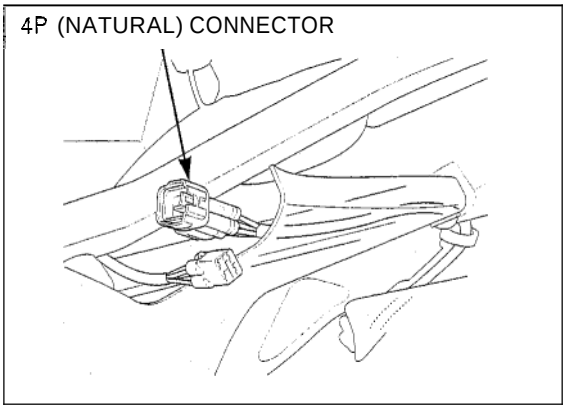


Remove the gasket.



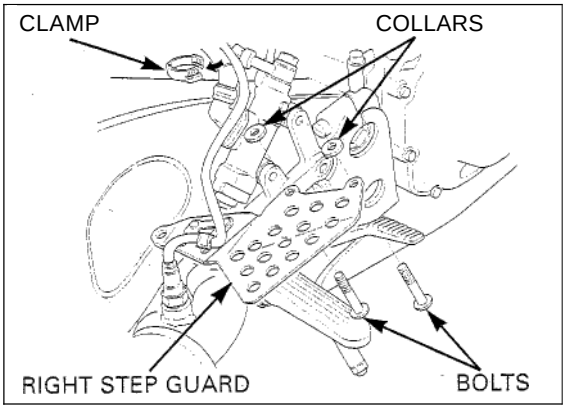
California type only

Disconnect the O2 sensor 4P (Natural) connector.
Remove the O2 sensor wire from the frame.



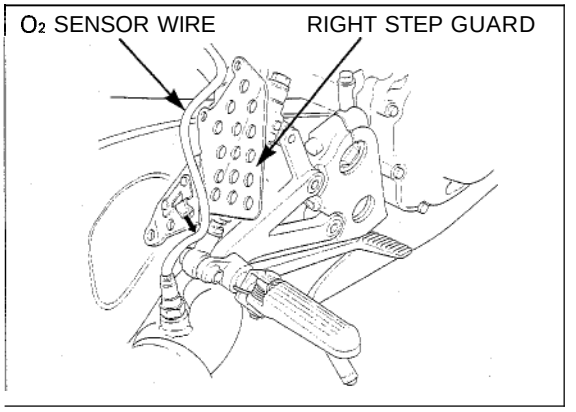
Caiifornia type only

Remove the O2 sensor wire clamp.
Remove the right step guard mounting bolts and collars.

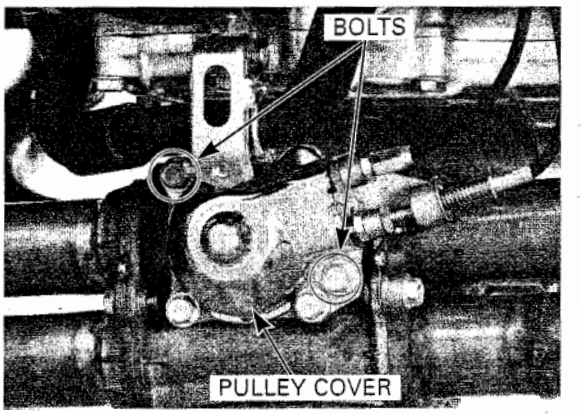


California type only:

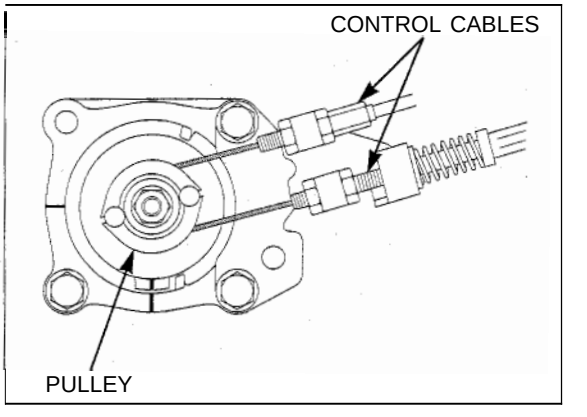
Rele se he O_2 sensor wire from the right step guard.



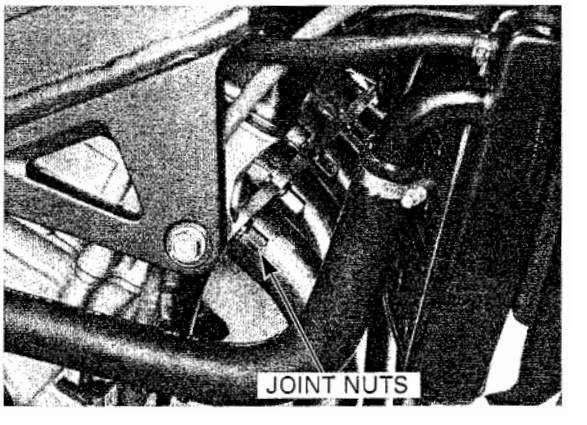
Remove the two bolts and EGCV (Exhaust Gas Control Valve) pulley cover.



Disconnect the EGCV control cables from the pulley.

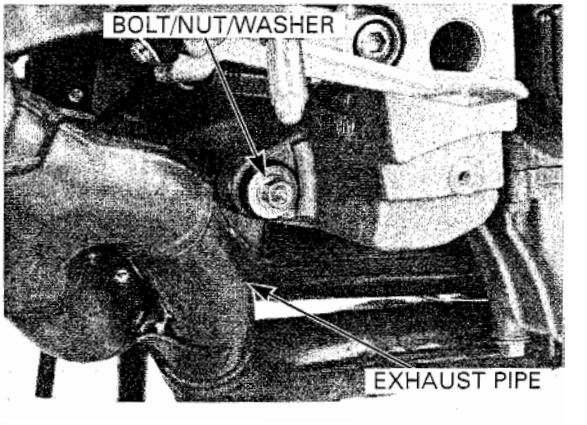


Remove the exhaust pipe joint nuts.



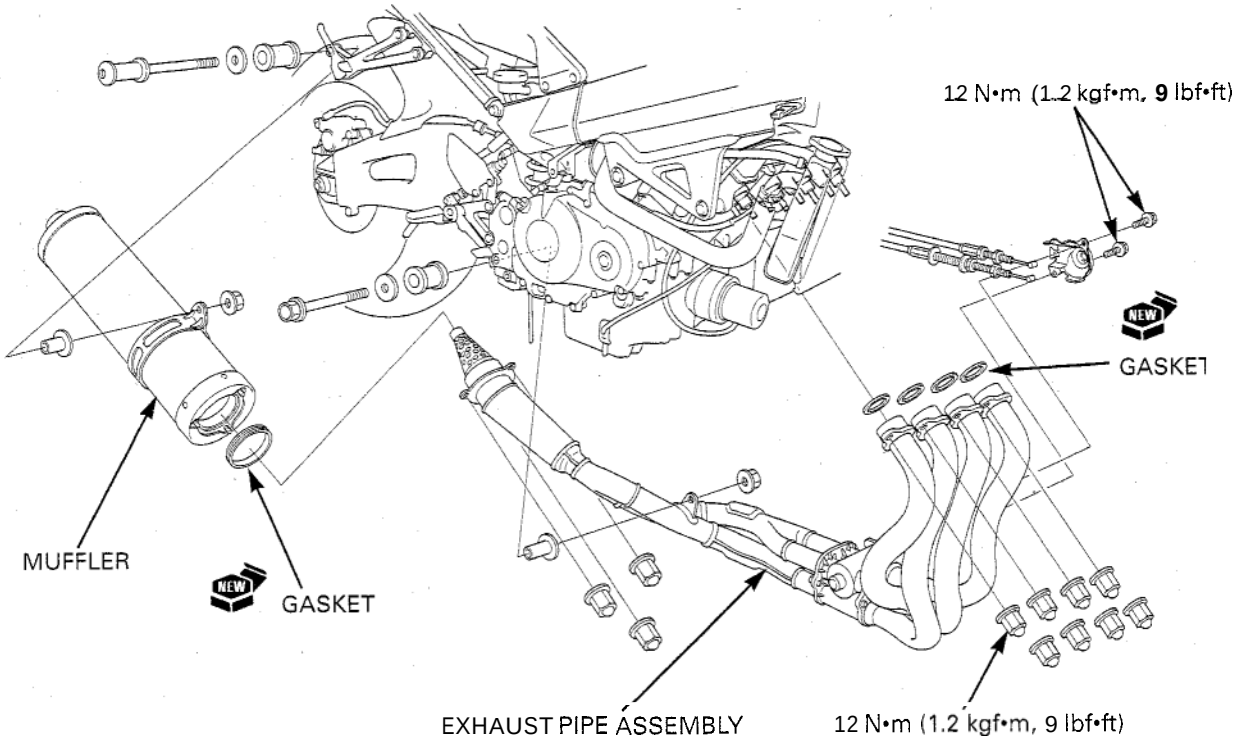
Remove the following:
- Exhaust pipe mounting bolt/nut
- Washer
- Collar
- Exhaust pipe
- Exhaust pipe gaskets

See page 5-97 for EGCV removal/disassembly.

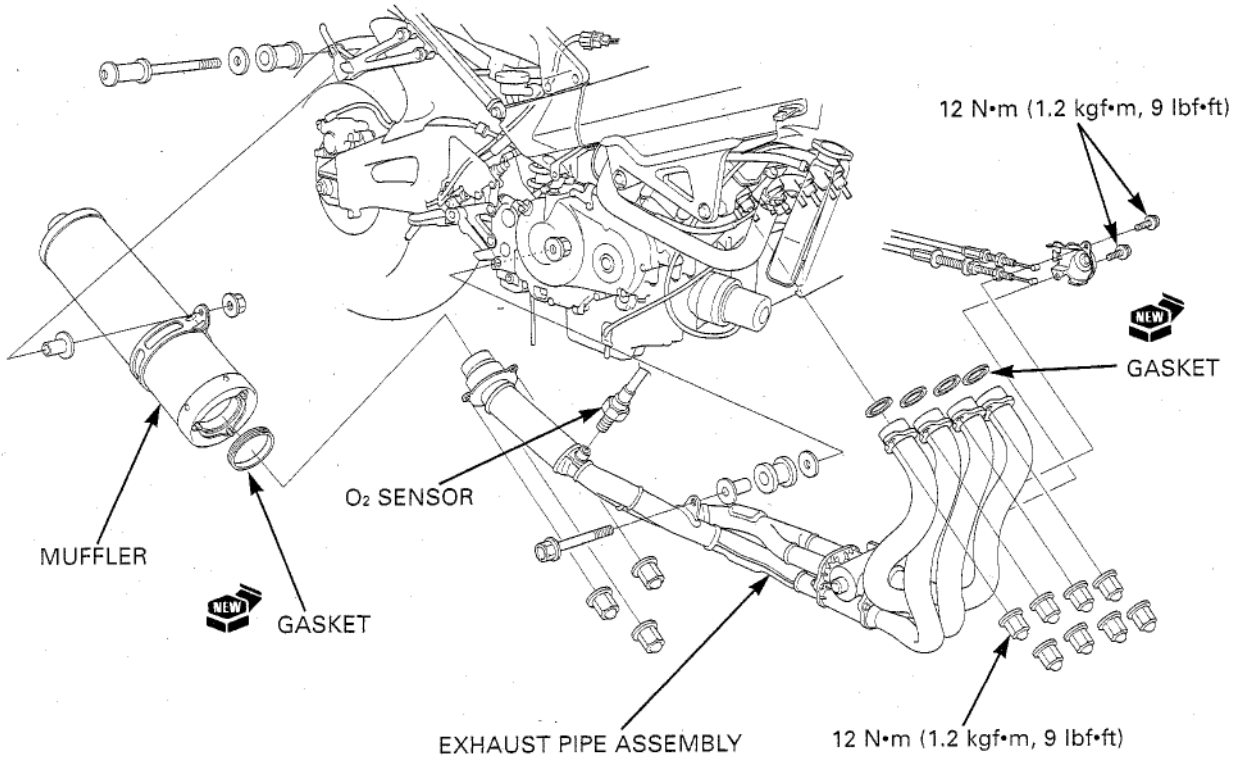


INSTALLATION

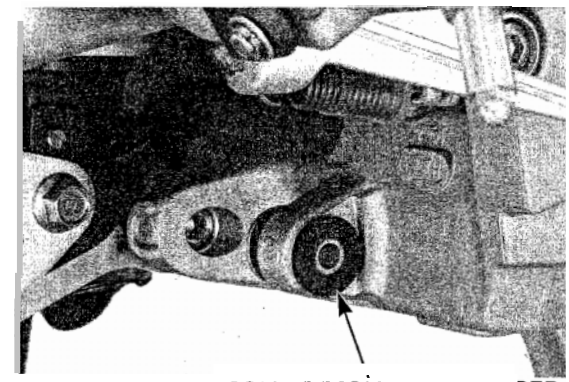
Non-California type:



California type:



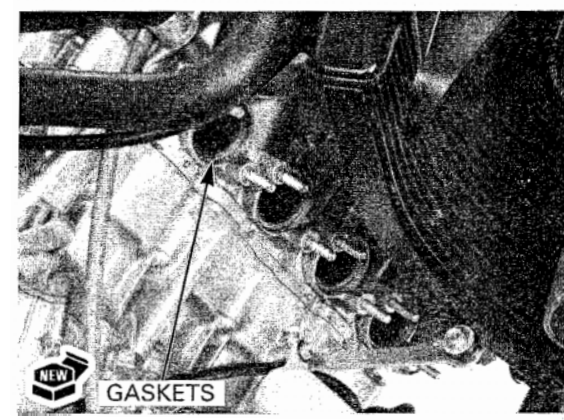
Install the exhaust pipe mounting rubber and collar into the lower bracket hole.



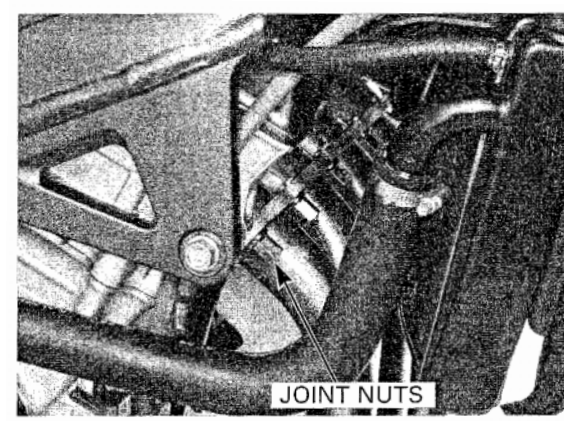
Check the protrusion of the exhaust pipe stud bolt (page 1-14).

Always replace the exhaustpipe gaskets with new ones

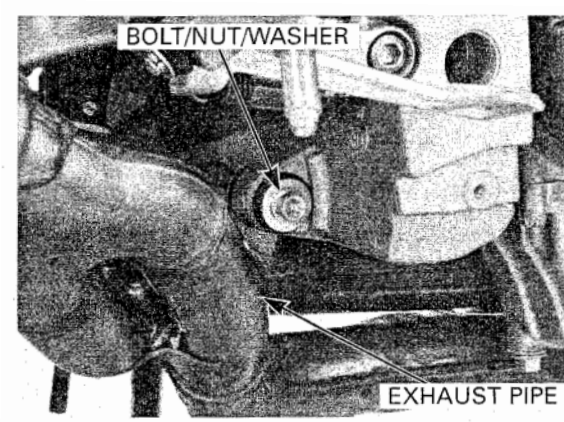
Install the new exhaust pipe gaskets onto the exhaust ports of the cylinder head.



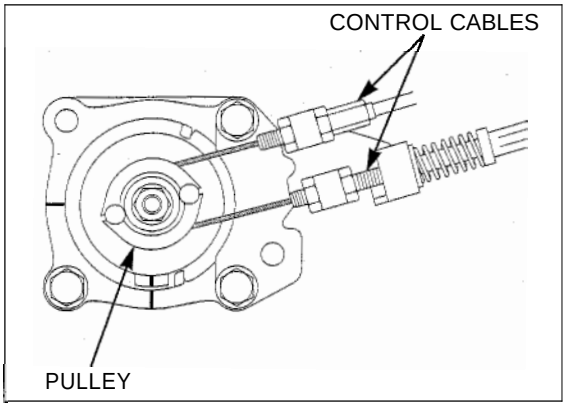
Install the exhaust pipe, and temporarily install the exhaust pipe joint nuts and mounting bolt/nut.



Temporarily tighten the exhaust pipe mounting nut.

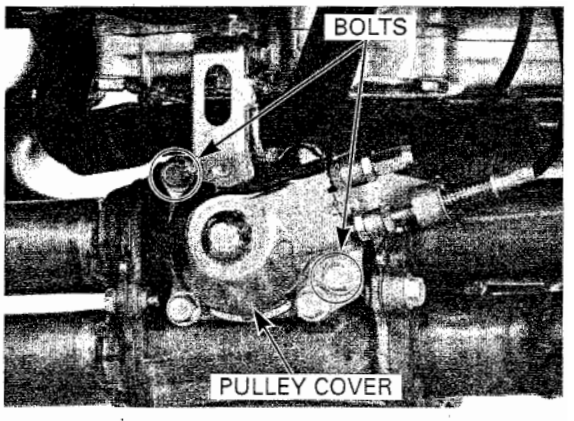


Connect the EGCV control cables to the cable pulley.



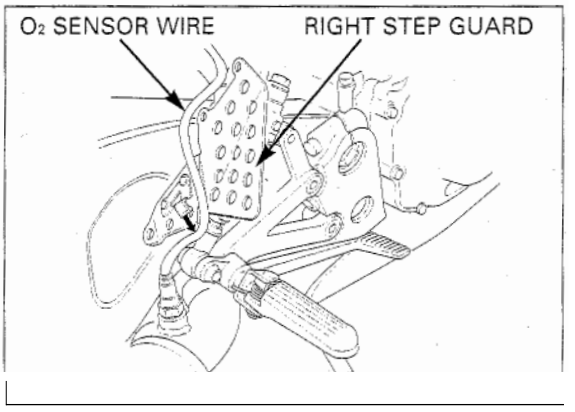
Install the EGCV pulley cover and tighten the bolts to the specified torque.

TORQUE: 12 N·m (1.2 kgf·m, 9 lbf·ft)



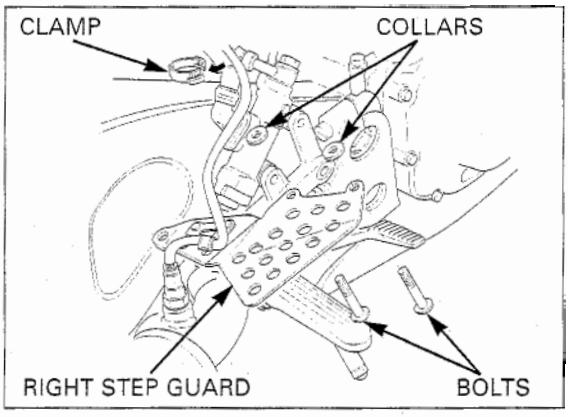
California type only:

Clamp the O_2 sensor wire to the right step guard.



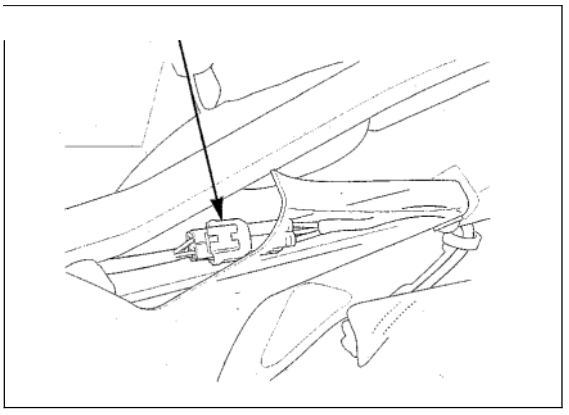
California type only

Install the rear master cylinder, collars and right step guard, then tighten the mounting bolts.
Clamp the O_2 sensor wire with the rear brake reservoir hose using the hose clamp.



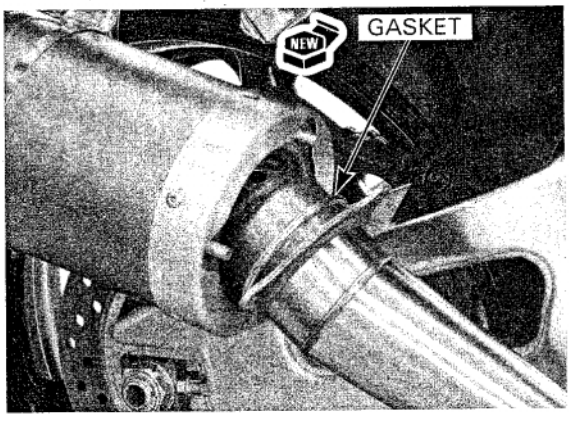
California type only

Route the O_2 sensor wire into the frame.
Connect the O_2 sensor 4P (Natural) connector.



Install the new gasket onto the exhaust pipe as shown.

Install the muffler.



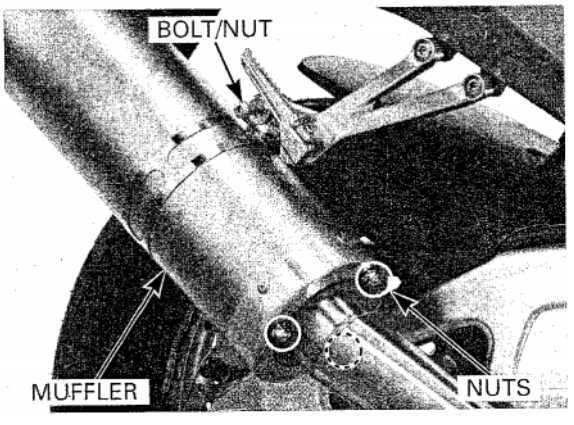
Temporarily install the muffler mounting bolt/nut and muffler joint nuts.

First tighten the exhaust pipe joint nuts

Tighten all of the muffler/exhaust pipe mounting bolts/nuts securely.

TORQUE:
Exhaust pipe joint nut: 12 N·m (1.2 kgf·m, 9 lbf·ft)

Install the lower cowl (page 2-7)



SERVICE INFORMATION	3-1	DRIVE CHAIN	3-20
MAINTENANCE SCHEDULE	3-3	BRAKE FLUID	3-24
FUEL LINE	3-4	BRAKE PAD WEAR	3-25
THROTTLE OPERATION	3-5	BRAKE SYSTEM	3-25
AIR CLEANER	3-6	BRAKE LIGHT SWITCH	3-26
SPARK PLUGS	3-6	HEADLIGHT AIM	3-27
VALVE CLEARANCE	3-10	CLUTCH SYSTEM	3-27
ENGINE OIL/OIL FILTER	3-15	SIDE STAND	3-28
ENGINE IDLE SPEED	3-17	SUSPENSION	3-28
RADIATOR COOLANT	3-18	NUTS, BOLTS, FASTENERS	3-31
COOLING SYSTEM	3-18	WHEELS/TIRES	3-31
SECONDARY AIR SUPPLY SYSTEM	3-19	STEERING HEAD BEARINGS	3-32
EVAPORATIVE EMISSION CONTROL SYSTEM (California type only)	3-19		

SERVICE INFORMATION

GENERAL

- Place the motorcycle on level ground before starting any work.
- Gasoline is extremely flammable and is explosive under certain conditions.
- Work in a well ventilated area. Smoking or allowing flames or sparks in the work area or where the gasoline is stored can cause a fire or explosion.
- If the engine must be running *to* do some work, make sure the area is well ventilated. Never run the engine in an enclosed area.
- The exhaust contains poisonous carbon monoxide gas that may cause loss of consciousness and may lead to death. Run the engine in an open area or with an exhaust evacuation system in an enclosed area.

Spark plug	Standard	IMR9C-9H (NGK), VUH27D (DENSO)
	Optional	IMR8C-9H (NGK), VUH24D (DENSO)
Spark plug gap		0.8 – 0.9 mm (0.03 – 0.04 in)
Valve clearance	IN	0.16 ± 0.03 mm (0.006 ± 0.001 in)
	EX	0.27 ± 0.03 mm (0.011 ± 0.001 in)
Engine oil capacity	At draining	3.5 liter (3.7 US qt, 3.1 Imp qt)
	At oil filter change	3.7 liter (3.9 US qt, 3.3 Imp qt)
Drive chain slack		40 – 50 mm (1.6 – 2.0 in)
Recommended brake fluid		Honda DOT 4 Brake Fluid
	Michelin	Rear: BT012R RADIAL G
		Rear: Pilot SPORT E
		Pilot SPORT E
	load	Rear: 290 kPa (2.90 kgf/cm², 42 psi)
	Up to maximum weight capacity	Front: 250 kPa (2.50 kgf/cm², 36 psi)
		Rear: 290 kPa (2.90 kgf/cm², 42 psi)
Minimum tire tread depth		Front: 1.5 mm (0.06 in)
		Rear: 2.0 mm (0.08 in)

TORQUE VALUES

Timing hole cap	18 N•m (1.8 kgf•m, 13 lbf•ft)	Apply grease to the threads.
Spark plug	12 N•m (1.2 kgf-m, 9 lbf•ft)	
Oil drain bolt	29 N•m (3.0 kgf•m, 22 lbf•ft)	
Oil filter cartridge	26 N•m (2.7 kgf•m, 20 lbf•ft)	Apply clean engine oil to the O-ring.
Rear axle nut	113 N•m (11.5 kgf-m, 83 lbf•ft)	U–nut
Drive sprocket special bolt	54 N•m (5.5 kgf-m, 40 lbf•ft)	
Driven sprocket nut	64 N•m (6.5 kgf•m, 47 lbf•ft)	
Rear master cylinder push rod lock nut	18 N•m (1.8 kgf-m, 13 lbf•ft)	

TOOLS

Oil filter wrench	07HAA–PJ70101 or 07HAA–PJ70100
Drive chain tool set	07HMH–MR10103 or 07HMH–MR1010C (U.S.A. only)
Cam chain tensioner holder	07ZMG–MCAA400 (U.S.A. only)

MAINTENANCE SCHEDULE

Perform the Pre-ride inspection in the Owner's Manual at each scheduled maintenance period.
I: Inspect and Clean, Adjust, Lubricate or Replace if necessary. C: Clean. R: Replace. A: Adjust. L: Lubricate.
The following items require some mechanical knowledge. Certain items (particularly those marked * and **) may require more technical information and tools. Consult their authorized Honda dealer.

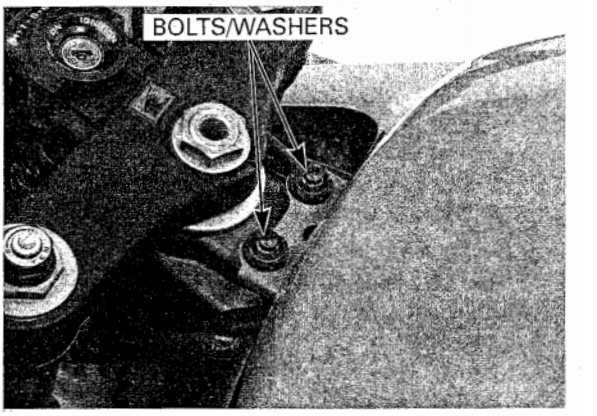
		ITEMS \ FREQUENCY	NOTE	X 1,000 mi	0.6	4	8	12	16	20	24	REFER TO PAGE
				X 100 km	10	64	128	192	256	320	384	
EMISSION RELATED ITEMS	*	FUEL LINE					I		I		I	3-4
	*	THROTTLE OPERATION					I		I		I	3-5
		AIR CLEANER	NOTE 2					I			I	3-6
		SPARK PLUGS			EVERY 16,000 mi (25,600 km): I EVERY 32,000 mi (51,200 km): R							3-6
	*	VALVECLEARANCE							I			3-10
		ENGINE OIL			R		R		R		R	3-15
		ENGINE OIL FILTER			R		R		R		R	3-15
	*	ENGINE IDLE SPEED			I	I	I	I	I	I	I	3-17
		RADIATOR COOLANT	NOTE 3				I		I		R	3-18
	*	COOLING SYSTEM					I		I		I	3-18
	*	SECONDARY AIR SUPPLY SYSTEM					I		I		I	3-19
	*	EVAPORATIVE EMISSION CONTROL SYSTEM	NOTE 4					I			I	3-19
	**	EGCV (Exhaust Gas Control Valve) CONTROL CABLE			EVERY 16,000 mi (25,600 km): I							5-93
NON-EMISSION RELATED ITEMS		DRIVE CHAIN			EVERY 500 mi (800 km): I, L							3-20
		BRAKE FLUID	NOTE 3			I	I	R	I	I	R	3-24
		BRAKE PAD WEAR				I	I	I	I	I	I	3-25
		BRAKE SYSTEM			I		I		I		I	3-25
	*	BRAKE LIGHT SWITCH					I		I		I	3-26
	*	HEADLIGHT AIM					I		I		I	3-27
		CLUTCH SYSTEM			I	I	I	I	I	I	I	3-27
		SIDE STAND					I		I		I	3-28
	*	SUSPENSION					I		I		I	3-28
	*	NUTS, BOLTS, FASTENERS			I		I		I		I	3-31
	**	WHEELS/TIRES					I		I		I	3-31
	**	STEERING HEAD BEARINGS			I		I		I		I	3-32

* Should be serviced by an authorized Honda dealer, unless the owner has proper tools and service data and is mechanically qualified.
** In the interest of safety, we recommend these items be serviced only by an authorized Honda dealer.

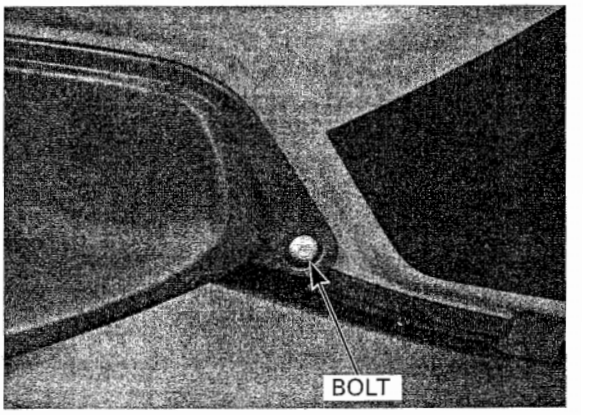
NOTES: 1. At higher odometer readings, repeat at the frequency interval established here.
2. Service more frequently if the motorcycle is ridden in unusually wet or dusty areas.
3. Replace every 2 years, or at the indicated odometer intervals, whichever comes first. Replacement requires mechanical skill.
4. California type only

FUEL LINE

Remove the front fuel tank mounting bolts and washers.

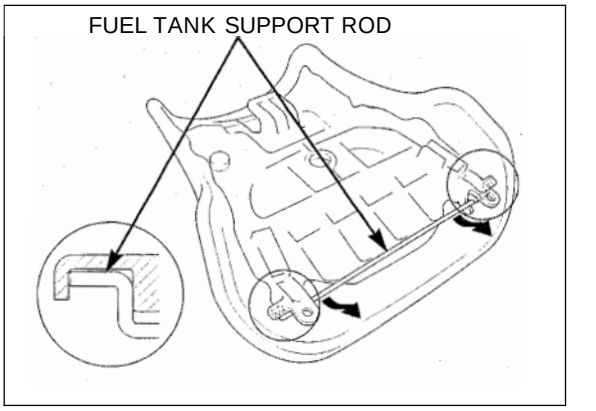


Remove the right and left duct cover mounting bolts.



After fuel line inspection, install the rod ends into the seat properly as shown

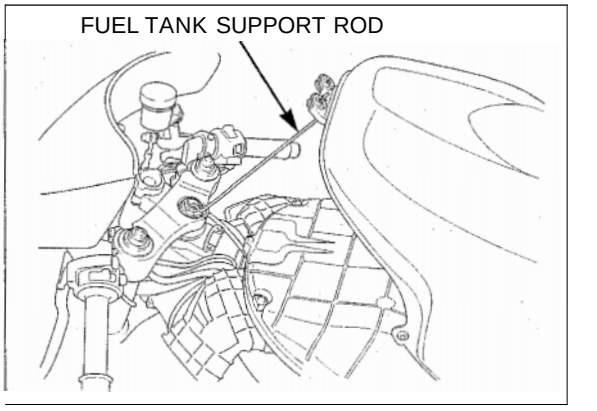
Remove the seat and then remove the fuel tank support rod from the seat.



Only use the rod to support the fuel tank

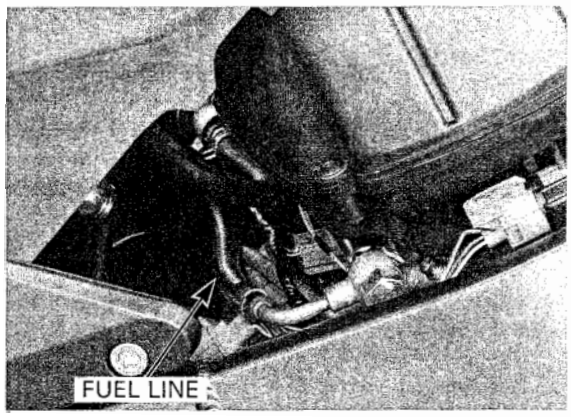
Open and support the front end of fuel tank using the support rod as shown.

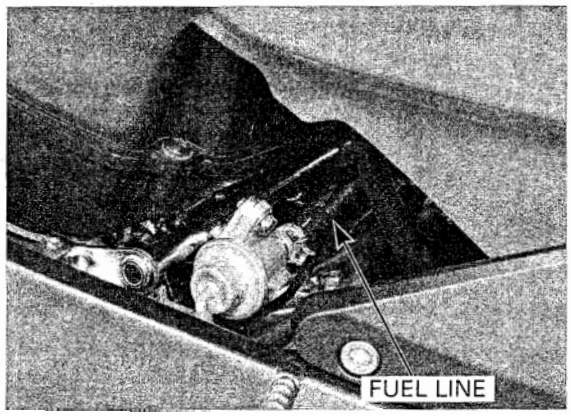
Do not lift the front end of fuel tank more than necessary to support it.



Check the fuel lines for deterioration, damage or leakage. Replace the fuel line if necessary.

Install the fuel tank in the reverse order of removal.



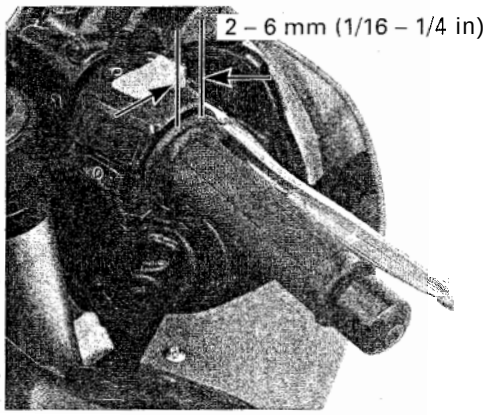


THROTTLE OPERATION

Check for smooth throttle grip full opening and automatic full closing in all steering positions.
Check the throttle cables and replace them if they are deteriorated, kinked or damaged.
Lubricate the throttle cables, if throttle operation is not smooth.

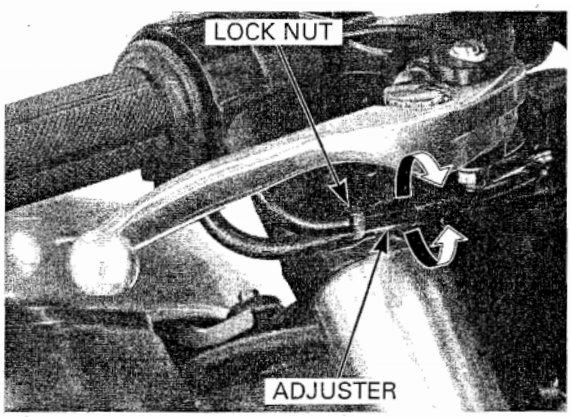
Measure the free play at the throttle grip flange.

FREE PLAY: 2 – *6* mm (1/16 – 1/4 in)



Throttle grip free play can be adjusted at either end of the throttle cable.

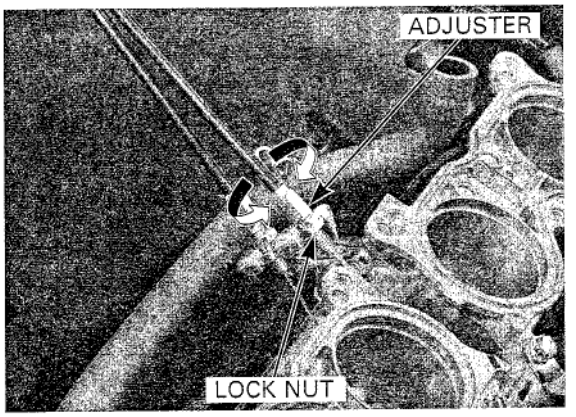
Minor adjustments are made with the upper adjuster. Adjust the free play by loosening the lock nut and turning the adjuster.



Major adjustments are made with the lower adjuster.

Remove the air cleaner housing (page 5-64).

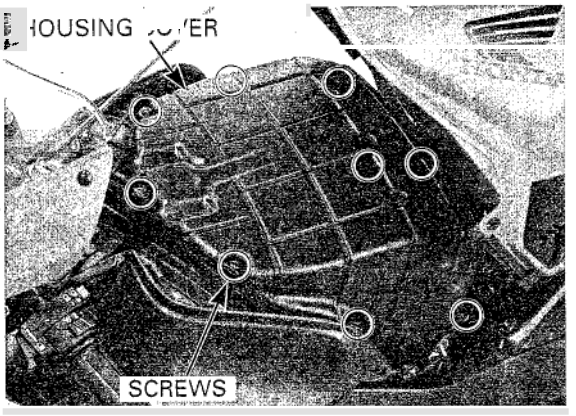
Adjust the free play by loosening the lock nut and turning the adjuster.
After adjustment, tighten the lock nut securely.
Recheck the throttle operation.
Replace any damaged parts, if necessary.



AIR CLEANER

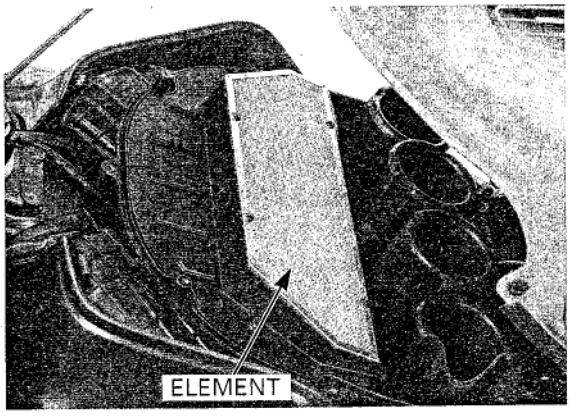
Open and support the front end of the fuel tank (page 3-4).

Remove the screws and air cleaner housing cover.



Remove and discard the air cleaner element in accordance with the maintenance schedule (page 3-3).
Also replace the air cleaner element anytime it is excessively dirty or damage.

Install the removed parts in the reverse order of removal.



SPARK PLUGS

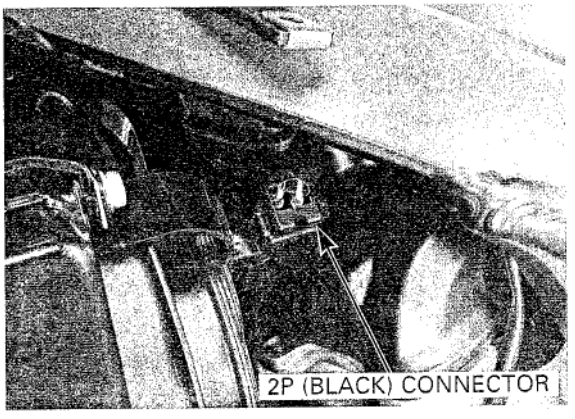
REMOVAL

NOTICE

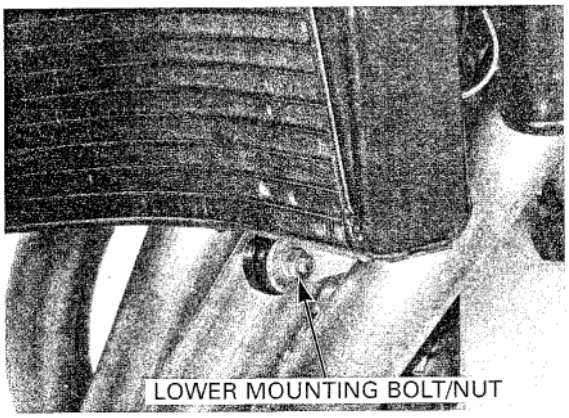
Be careful not to damage the radiator fins.

Remove the lower cowl (page 2-7).

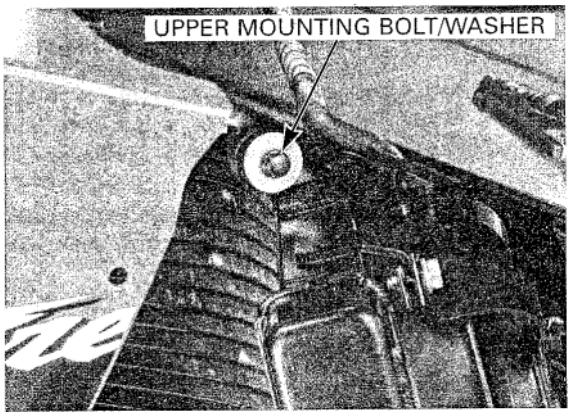
Disconnect the fan motor wire **2P** (Black) connector.



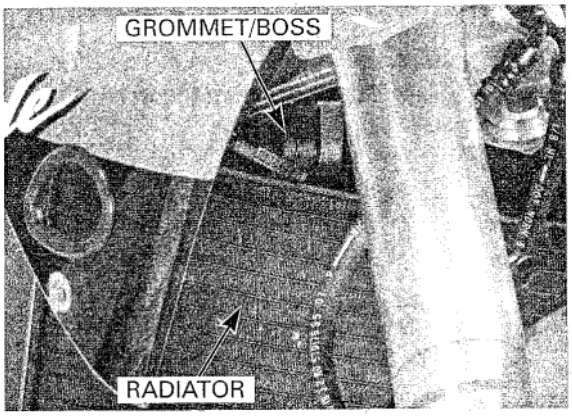
Remove the radiator lower mounting bolt/nut.



Remove the radiator upper mounting bolt and washer.

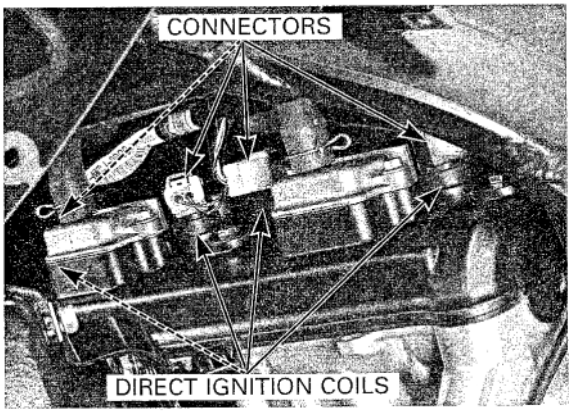


Remove the radiator grommet from the frame boss by moving it to the right, then move the radiator forward.



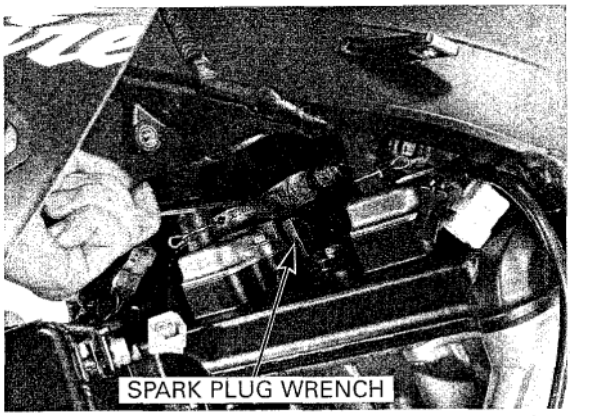
Clean around the spark plug bases with compressed air before removing, and be sure that no debris is allowed to enter the combustion chamber

Disconnect the direct ignition coil connectors.
Remove the direct ignition coils from the spark plugs.



Remove the spark plug using the equipped spark plug wrench or an equivalent.

Inspect or replace as described in the maintenance schedule.



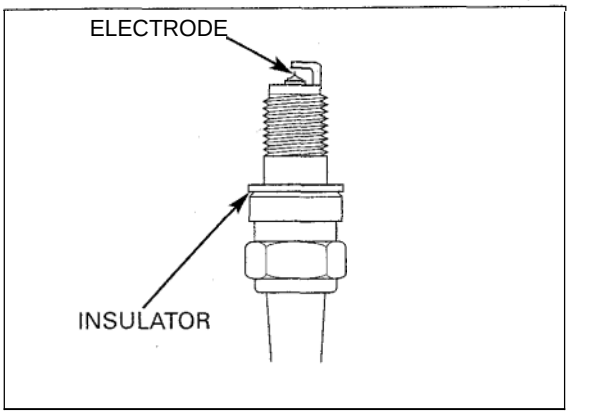
INSPECTION

Check the following and replace if necessary (recommended spark plug: page 3-2)

- Insulator for damage
- Electrodes for wear
- Burning condition, coloration

This motorcycle's spark plugs are equipped with iridium center electrodes Replace any spark plug if the electrode is contaminated

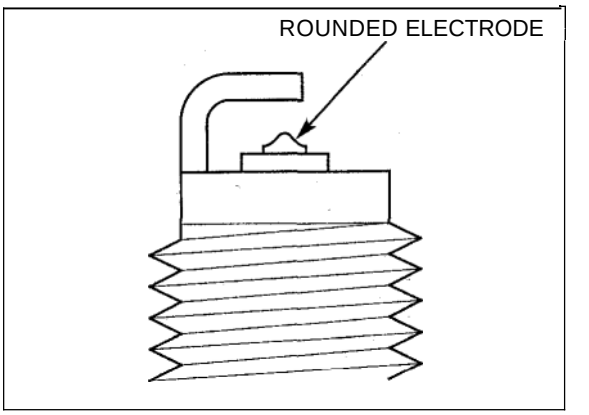
If the electrodes are contaminated with accumulated objects or dirt, replace the spark plug.



Replace the plug if the center electrode is rounded as shown in the illustration.

Always use the specified spark plugs on this motorcvcle.

SPECIFIED SPARK PLUG: IMR9C-9H (NGK)
VUH27D (DENSO)

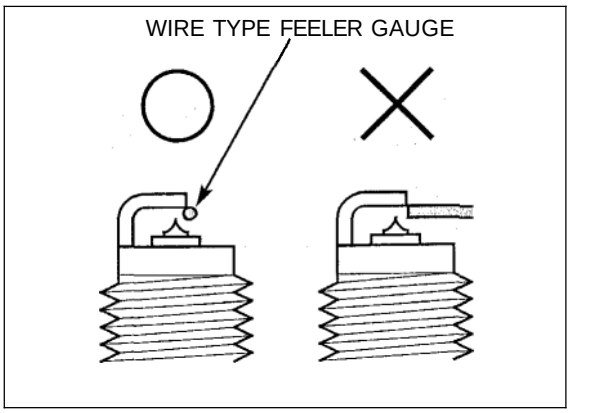


To prevent damaging the iridium center electrode, use a wire type feeler gauge to check the spark plug gap

Check the gap between the center and side electrodes with a wire type feeler gauge.

Do not adjust the spark plug gap If the gap is out of specification, replace the spark plug with a new one

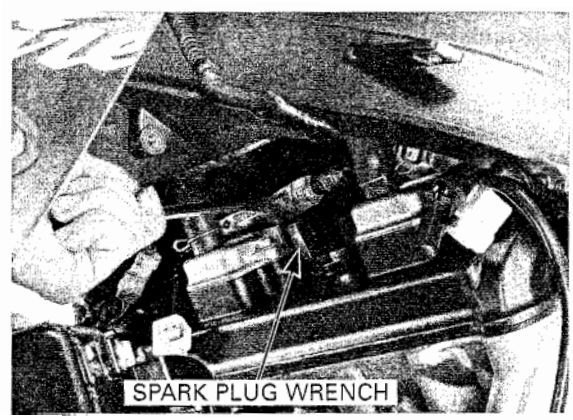
Make sure the 1.0 mm (0.04 in) diameter plug gauge does not insert between the gap.
If the gauge can be inserted into the gap, replace the plug with a new one.



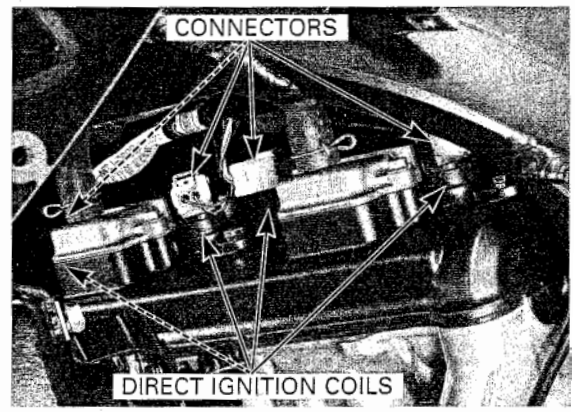
Reinstall the spark plug in the cylinder head and hand tighten, then torque to specification.

TORQUE: 12 N·m (1.2 kgf·m, 9 lbf·ft)

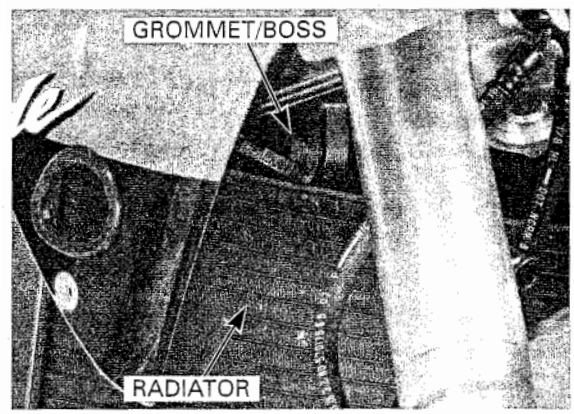
If using the new plug, install as follows:
Install and hand tighten the new spark plug, then tighten it about 1/2 turn after the sealing washer contacts the seat of the plug hole.



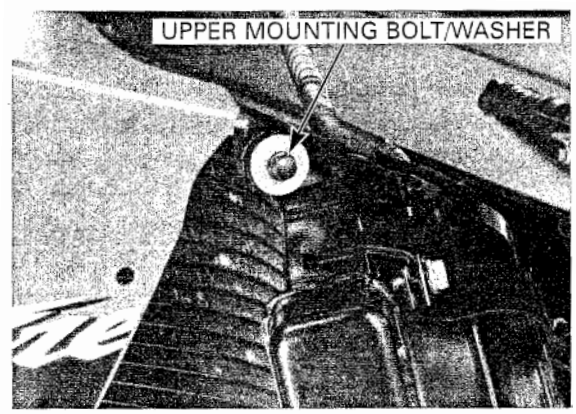
Install the direct ignition coils.
Connect the direct ignition coil connectors.



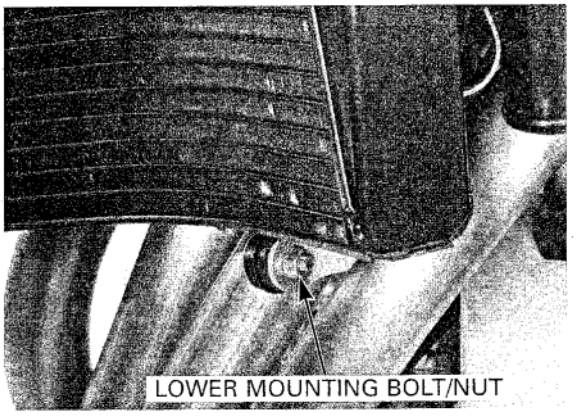
Install the radiator grommet onto the frame boss.



Install the washer and radiator upper mounting bolt, then tighten the bolt.

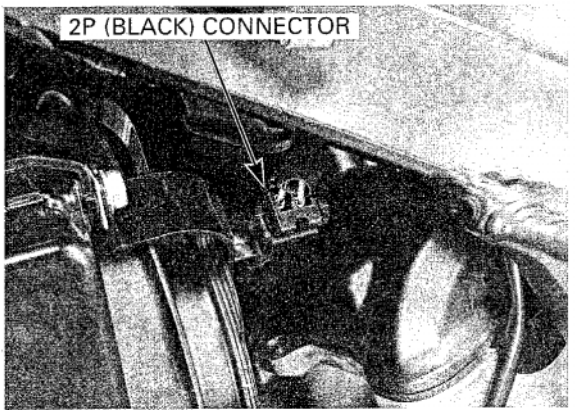


Install and tighten the radiator lower mounting bolt/nut.



Connect the fan motor wire 2P (Black) connector.

Install the lower cowl (page 2-7).



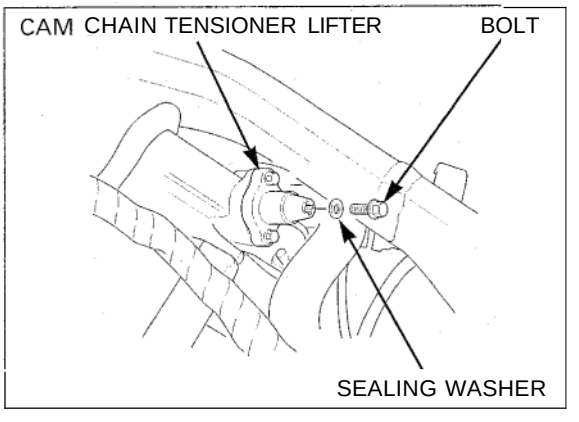
VALVE CLEARANCE

inspect and adjust the valve clearance while the engine is cold (below 35°C/95°F)

INSPECTION

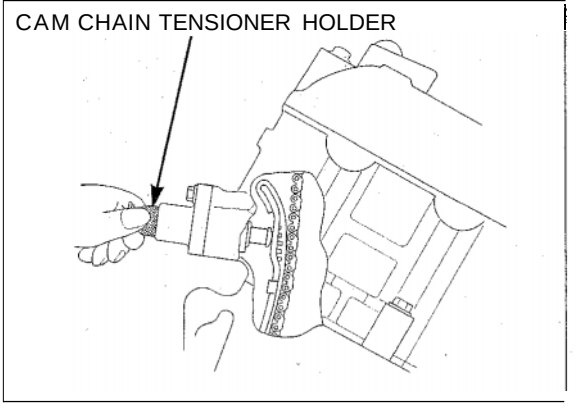
Remove the cylinder head cover (page 8-5).

Remove the cam chain tensioner lifter sealing bolt and sealing washer.

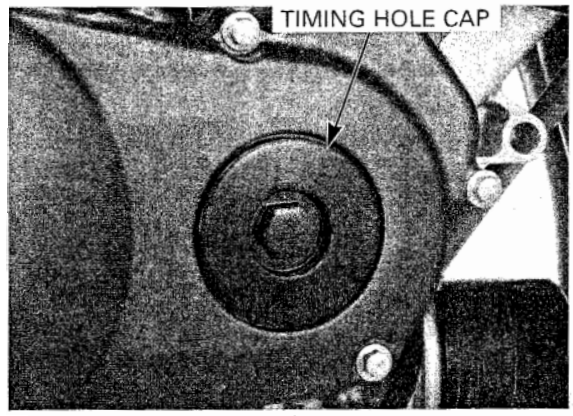


Turn the cam chain tensioner lifter shaft fully in (clockwise) and secure it using the special tool.

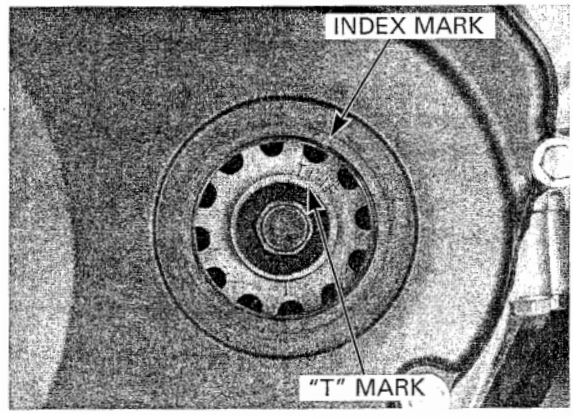
TOOL:
Cam chain tensioner holder **07ZMG–MCAA400 (U.S.A. only)**



Remove the timing hole cap and O-ring.

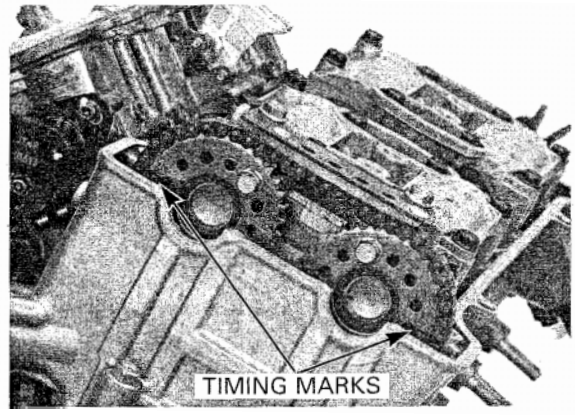


Turn the crankshaft clockwise, and align the "T" mark on the ignition pulse generator rotor with the index mark on the right crankcase cover.



The timing marks ("IN" and "EX") on the cam sprockets must be flush with the cylinder head surface and facing outward as shown.

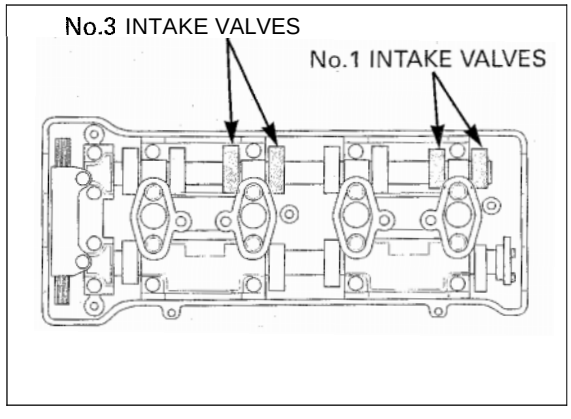
If the timing marks on the cam sprocket face inward, turn the crankshaft clockwise one full turn (360°) and realign the timing marks with the cylinder head surface so they are facing outward.



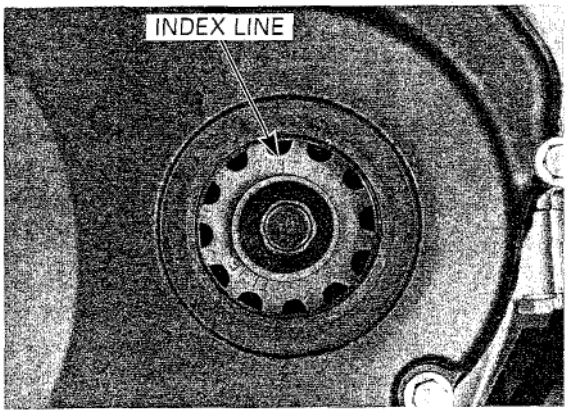
Record the clearance for each valve for reference in shim selection if adjustment is required

Insert a feeler gauge between the valve lifter and the cam lobe.
Check the valve clearance for the No.1 and No.3 cylinder intake valves using a feeler gauge.

VALVE CLEARANCE:
IN: 0.16 ± 0.03mm *(0.006 ± 0.001 in)*



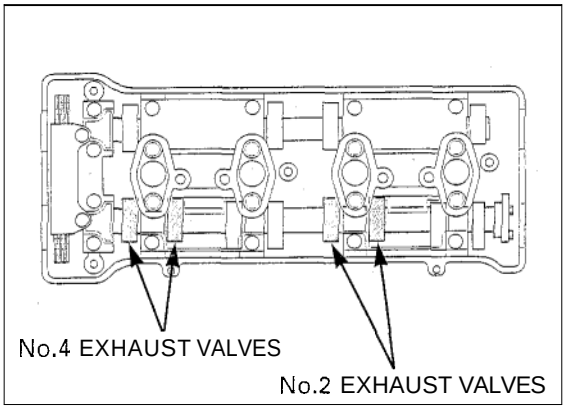
Turn the crankshaft clockwise 1/2 turn (180°), align the index line on the ignition pulse generator rotor so that it is facing up as shown.



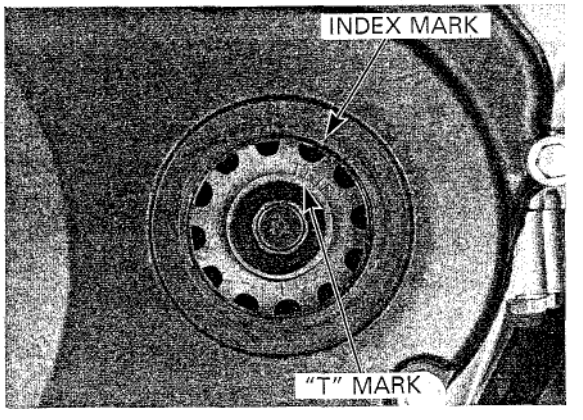
Record the clearance for each vaive for reference in shim selection if adjustment is required

Check the valve clearance for the No.2 and No.4 cylinder exhaust valves using a feeler gauge.

VALVE CLEARANCE:
EX: 0.27 ±0.03 mm (0.011 ±0.001 in)



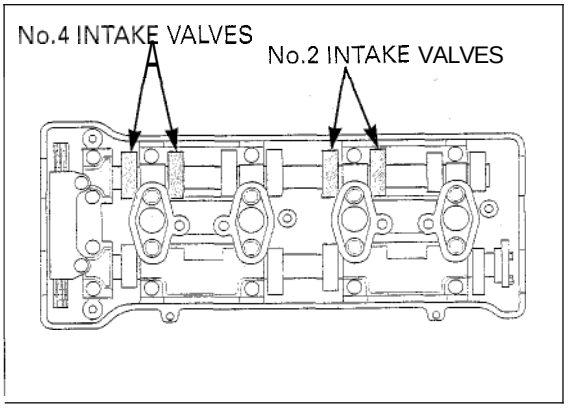
Turn the crankshaft clockwise 1/2 turn (180°), and align the "T" mark on the ignition pulse generator rotor with the index mark on the right crankcase cover.



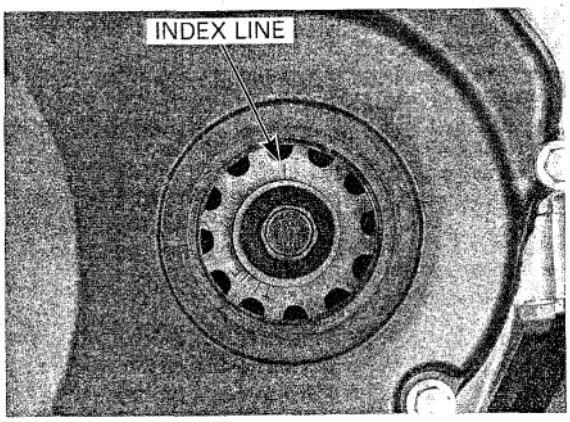
Record tne clearance for each vaive for reference in shim selection if adjustment is required

Check the valve clearance for the No.2 and No.4 cylinder intake valves using a feeler gauge.

VALVE CLEARANCE:
IN: 0.16 ± 0.03mm (0.006 ±0.001 in)



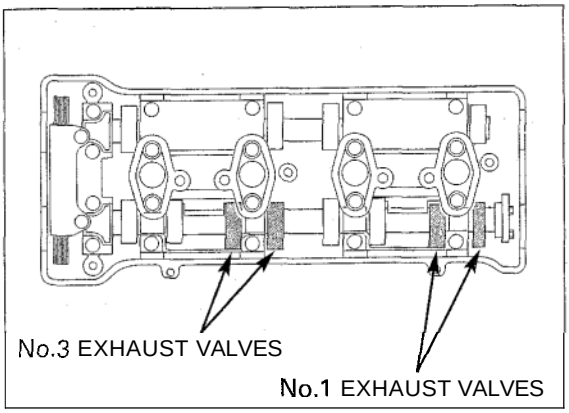
Turn the crankshaft clockwise 1/2 turn (180°), and align the index line on the ignition pulse generator rotor so it is facing up as shown.



Record the clearance for each vaive for reference in shim selection if adjustment is required

Check the valve clearance for the No.1 and No.3 cylinder exhaust valves using a feeler gauge.

VALVE CLEARANCE:
EX: 0.27 ± 0.03 mm (0.011 ± 0.001 in)

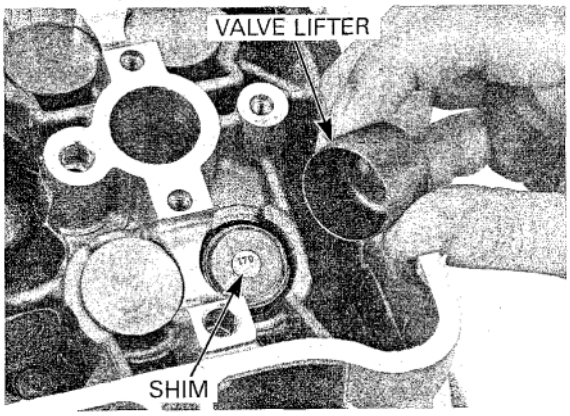


ADJUSTMENT

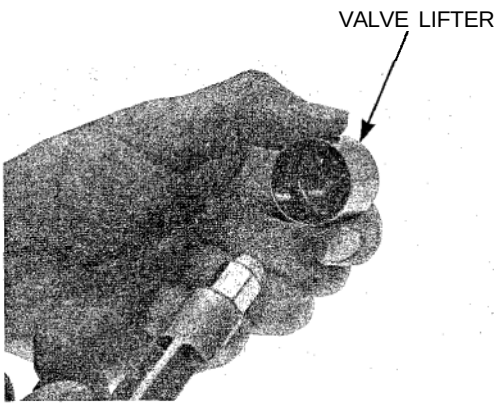
Remove the camshaft (page 8-7).

Remove the valve lifters and shims.

- Shims may stick to the inside of the valve lifter. Do not allow the shims to fall into the crankcase.
- Mark all valve lifters and shims to ensure correct reassembly in their original locations.
- The valve lifter can be easily removed with a valve lapping tool or magnet.
- The shims can be easily removed with tweezers or a magnet.



Clean the valve shim contact area in the valve lifter with compressed air.



Sixty-five different shim thicknesses are available from 1200 rnm to 2 800 mm in intervals of 0 025 mm

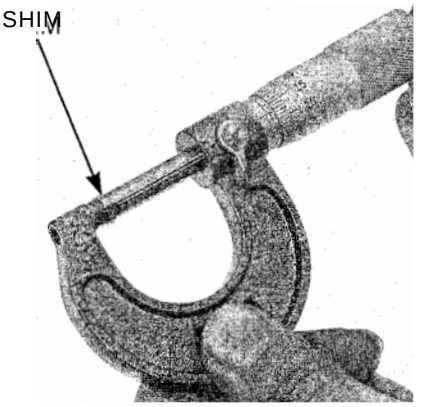
Measure the shim thickness and record it.

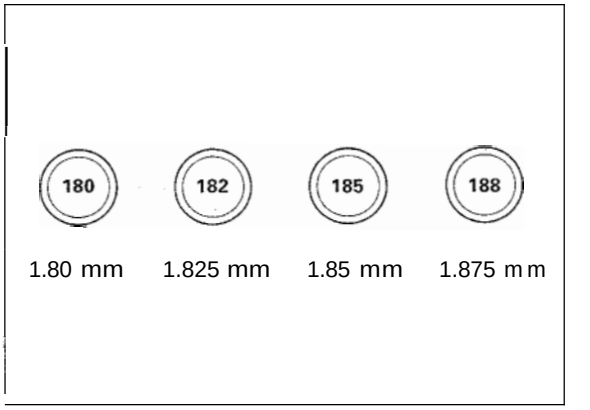
Calculate the new shim thickness using the equation below.

A = (B – C) + D

A: New shim thickness
B: Recorded valve clearance
C: Specified valve clearance
D: Old shim thickness

- Make sure of the correct shim thickness by measuring the shim with a micrometer.
- Reface the valve seat if carbon deposits result in a calculated dimension of over 2.800 mm.





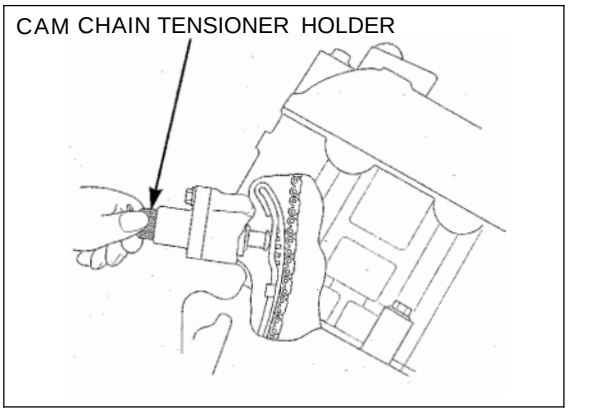
Install the shims and valve lifters in their original locations

Install the newly selected shim on the valve retainer.
Apply molybdenum disulfide oil to the valve lifters.
Install the valve lifters into the valve lifter holes.

Install the camshafts (page 8-24).

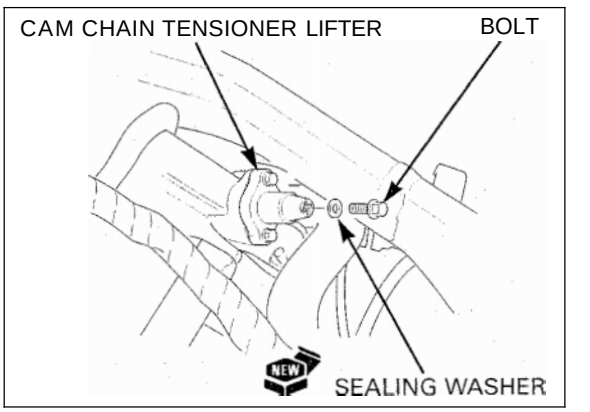
Rotate the camshafts by rotating the crankshaft clockwise several times.
Recheck the valve clearance.

Remove the cam chain tensioner holder.



Install the new sealing washer and cam chain tensioner lifter sealing bolt.
Tighten the bolt securely.

Install the removed parts in the reverse order of removal.



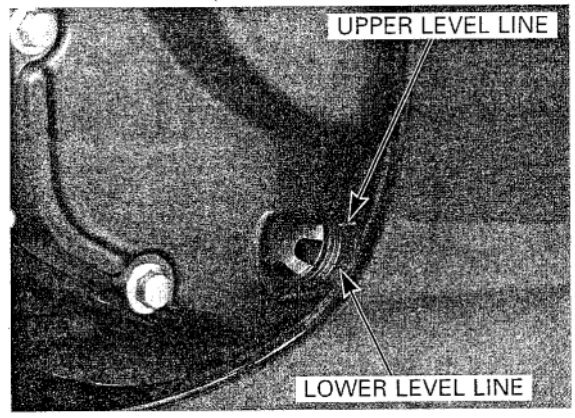
ENGINE OIL/OIL FILTER

OIL LEVEL INSPECTION

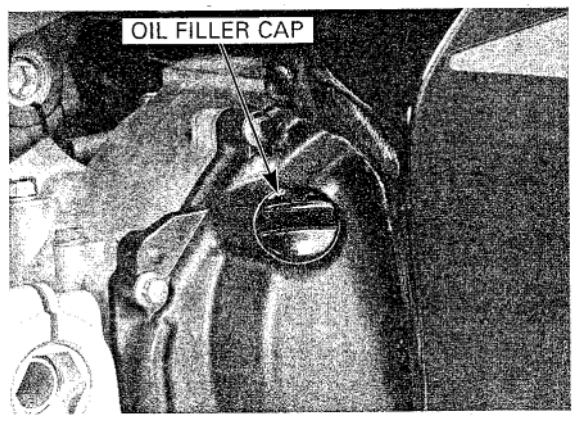
Start the engine and let it idle for 2 – 3 minutes.
Turn off the engine and support the motorcycle on a level surface.

Check the oil level through the inspection window.

If the level is below the lower line, remove the oil filler cap and fill the crankcase with the recommended oil to the upper level line.



Remove the oil filler cap.

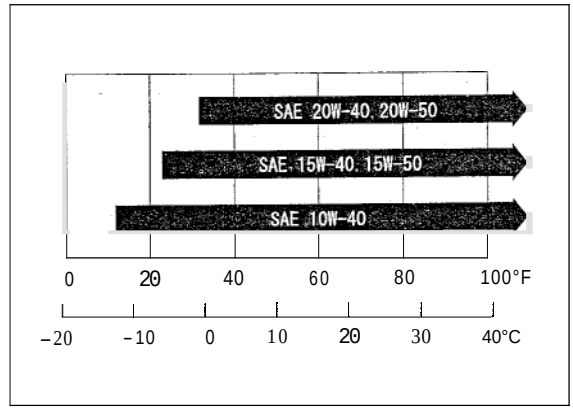


Fill the recommended engine oil up to the upper level line.

Other viscosities shown in the chart may be used when the average temperature in your riding area is within the indicated range

RECOMMENDED ENGINE OIL:
Pro Honda GN4 or HP4 (without molybdenum additives) 4-stroke oil or equivalent motor oil
API service classification: SG or higher
JASO T 903 standard: MA
Viscosity: SAE 10W–40

Reinstall the filler cap and dipstick.

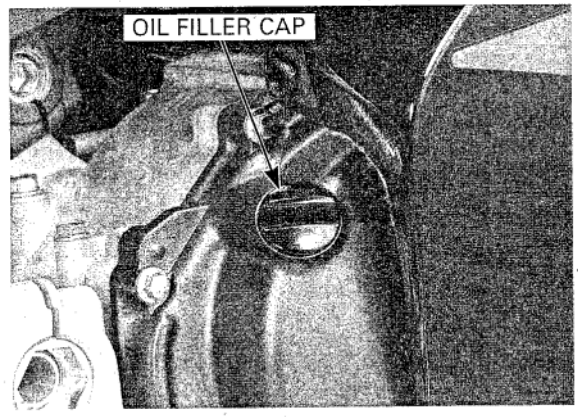


ENGINE OIL & FILTER CHANGE

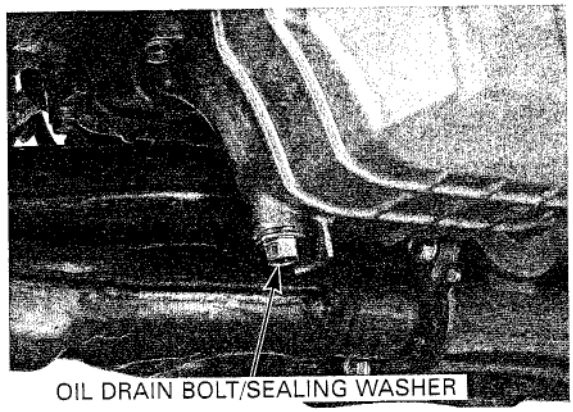
Change the engine oil with the engine warm and the motorcycle on level ground to assure complete draining

Warm up the engine.
Remove the lower cowl (page 2-7).

Stop the engine and remove the oil filler cap.

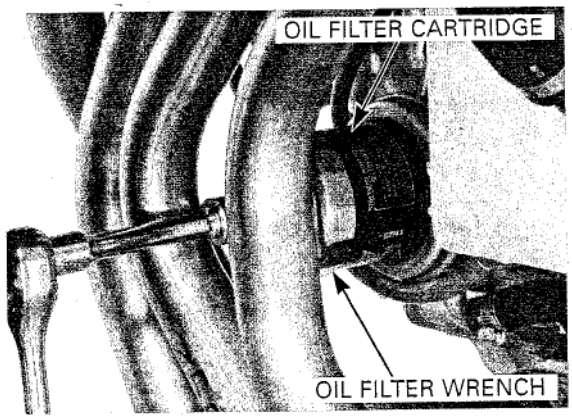


Remove the drain bolt and drain the oil completely



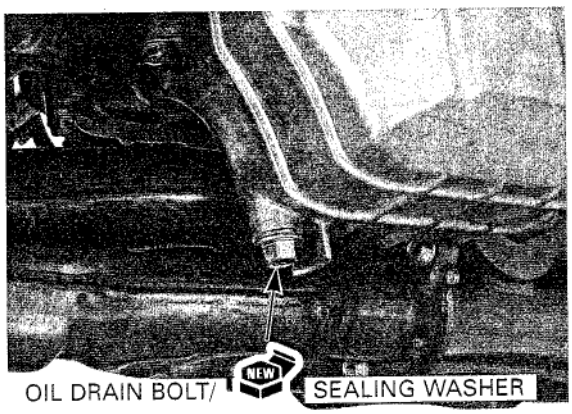
Remove and discard the oil filter cartridge using the special tool.

TOOL:
Oil filter wrench **07HAA–PJ70101 or 07HAA–PJ70100**

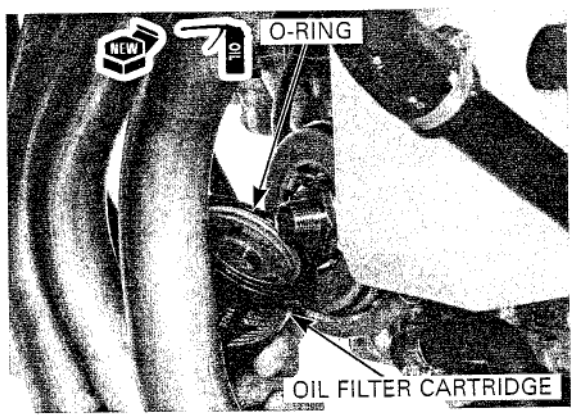


Check that the sealing washer on the drain bolt is in good condition, and replace if necessary.
Install and tighten the drain bolt.

TORQUE: 29 N·m (3.0 kgf·m, 22 lbf·ft)



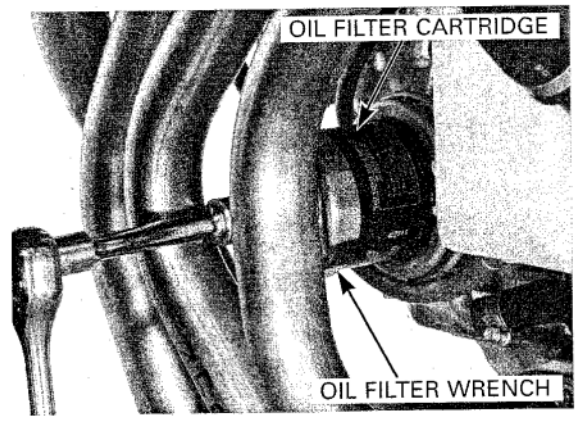
Apply oil to the new oil filter O-ring.



Install the new oil filter and tighten it to the specified torque.

TOOL:
Oil filter wrench 07HAA-PJ70101 or 07HAA-PJ70100

TORQUE: 26 N·m (2.7 kgf·m, 20 lbf·ft)



Fill the crankcase with the recommended engine oil.

OIL CAPACITY:
3.5 liter (3.7 US qt, 3.1 Imp qt) at draining
3.7 liter (3.9 US qt, 3.3 Imp qt) at oil filter change

Install the oil filler cap.

Start the engine and let it idle for 2 to 3 minutes.
Stop the engine and recheck the oil level.
Make sure there are no oil leaks.

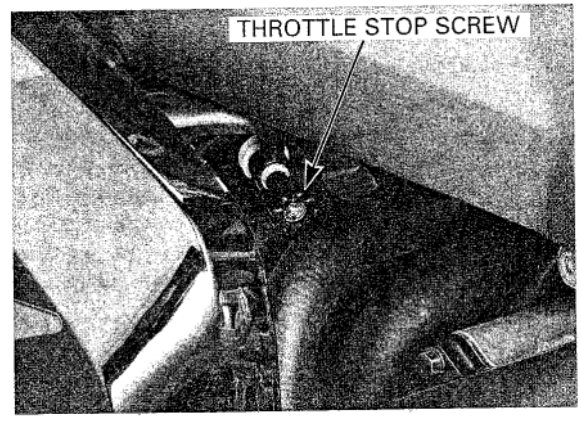
Install the lower cowl (page 2-7).

ENGINE IDLE SPEED

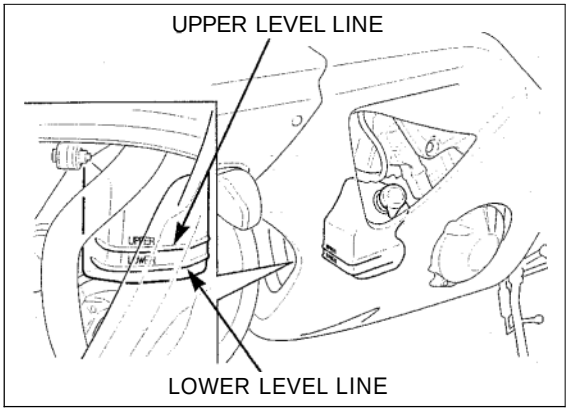
- Inspect and adjust the idle speed after all other engine maintenance items have been performed and are within specifications.
- The engine must be warm for accurate idle speed inspection and adjustment.

Warm up the engine for about 10 minutes.
Turn the throttle stop screw as required to obtain the specified idle speed.

IDLE SPEED: 1,200 ± 100 rpm



RADIATOR COOLANT



Check the coolant level of the reserve tank with the engine running at normal operating temperature.
The level should be between the "UPPER" and "LOWER" level lines.

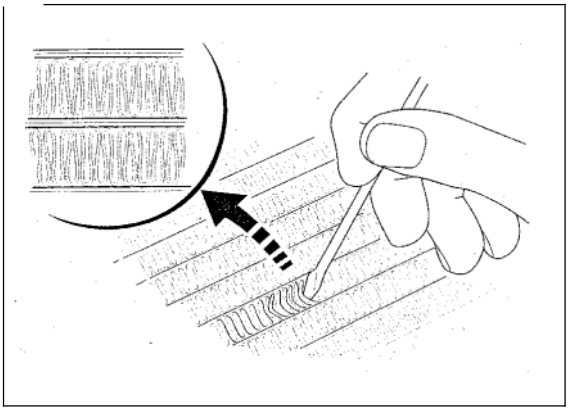
If necessary, add the recommended coolant.

RECOMMENDED ANTIFREEZE:
Pro Honda HP Coolant or an equivalent high quality ethylene glycol antifreeze containing corrosion protection inhibitors.

Remove the lower cowl (page 2-7).

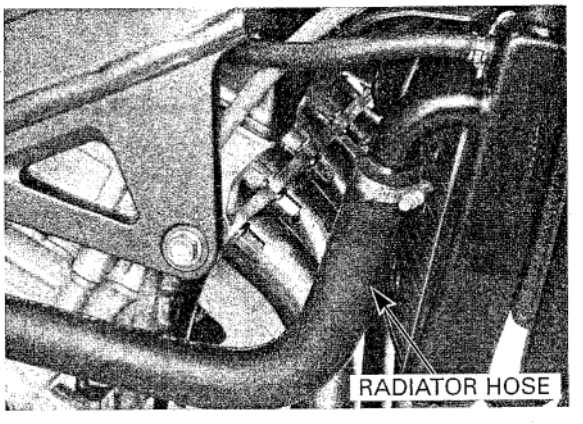
Remove the reserve tank filler cap and fill to the "UPPER" level line with a 1:1 mixture of distilled water and antifreeze.
Reinstall the filler cap.

COOLING SYSTEM



Remove the lower cowl (page 2-7).

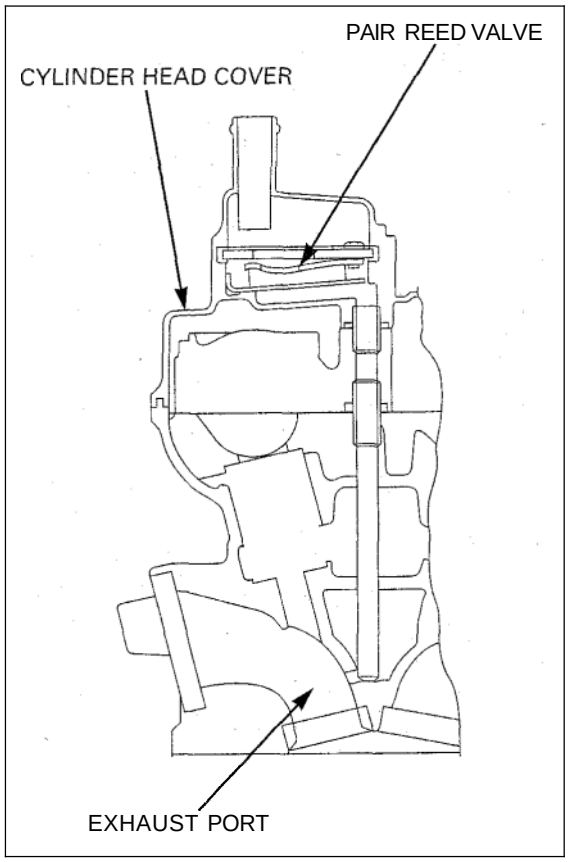
Check the radiator air passages for clogs or damage.
Straighten bent fins, and remove insects, mud or other obstructions with compressed air or low water pressure.
Replace the radiator if the air flow is restricted over more than 20% of the radiating surface.



Inspect the radiator hoses for cracks or deterioration, and replace if necessary.
Check the tightness of all hose clamps and fasteners.

SECONDARY AIR SUPPLY SYSTEM

- This model is equipped with a built-in secondary air supply system. The pulse secondary air supply system is located on the cylinder head cover.
- The secondary air supply system introduces filtered air into exhaust gases in the exhaust port. The secondary air is drawn into the exhaust port whenever there are negative pressure pulses in the exhaust system. This charged secondary air promotes burning of the unburned exhaust gases and changes a considerable amount of hydrocarbons and carbon monoxide into relatively harmless carbon dioxide and water.

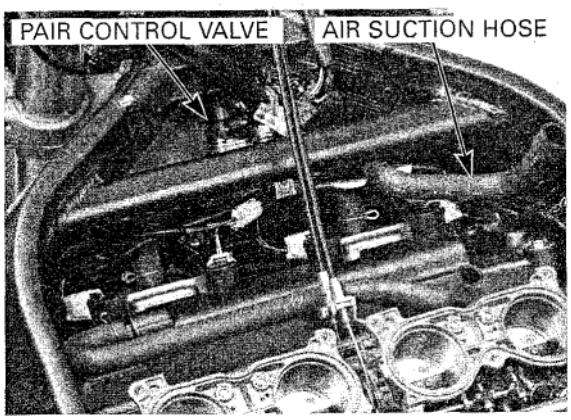


Remove the air cleaner housing (page 5-64).

if the hoses show any signs of heat damage, inspect the PAIR check valve in the PAIR reed vaive cover for damage.

Check the PAIR (pulse secondary air injection) hoses between the PAIR control solenoid valve and cylinder head cover for deterioration, damage or loose connections. Make sure the hoses are not cracked.

Check the air suction hose between the air cleaner housing and PAIR control solenoid valve for deterioration, damage or loose connections.
Make sure the hoses are not kinked, pinched or cracked.

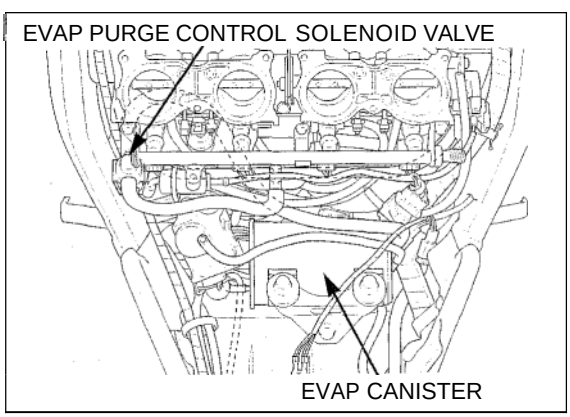


EVAPORATIVE EMISSION CONTROL SYSTEM (California type only)

Check the hoses between the fuel tank, EVAP canister, EVAP purge control solenoid valve for deterioration, damage or loose connections.

Check the EVAP canister for cracks or other damage.

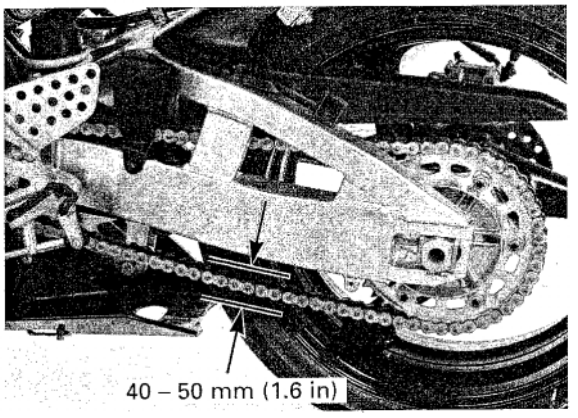
Refer to the Vacuum Hose Routing Diagram label (page 1-40) and Cable & Harness Routing (page 1-28) for hose connections.



DRIVE CHAIN

Never inspect and adjust the drive chain while the engine is running

DRIVE CHAIN SLACK INSPECTION



Turn the ignition switch to "OFF", place the motorcycle on its side stand and shift the transmission into neutral.
Check the slack in the drive chain lower run midway between the sprockets.

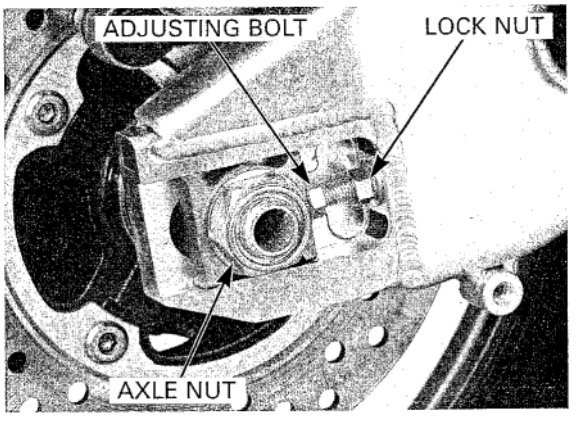
CHAIN SLACK: 40 – 50 mm (1.6 – 2.0 in)

NOTICE

Excessive chain slack, 50 mm (2.0 in) or more, may damage the frame.

Lubricate the drive chain with #80 – 90 gear oil or drive chain lubricant designed specifically for use with O-ring chains. Wipe off the excess oil or chain lubricant.

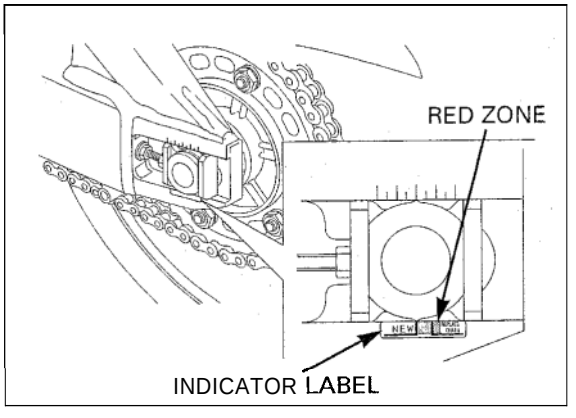
ADJUSTMENT



Loosen the rear axle nut.
Loosen the drive chain adjust bolt lock nuts and turn both adjusting bolts until the correct drive chain slack is obtained.
Make sure the index marks on both adjusting plates are aligned with the swingarm index mark.
Tighten the rear axle nut to the specified torque.

TORQUE: 113 N•m (11.5 kgf•m, 83 lbf•ft)

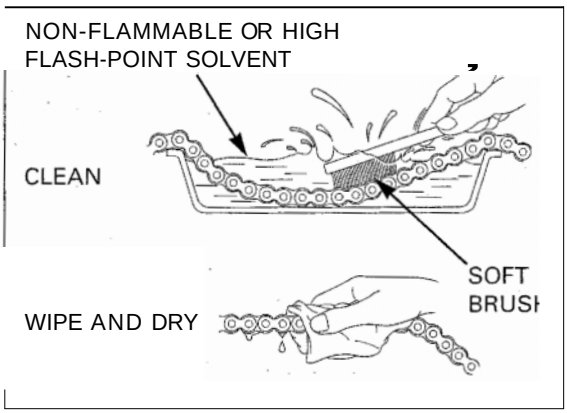
Tighten both drive chain adjusting bolt lack nuts.



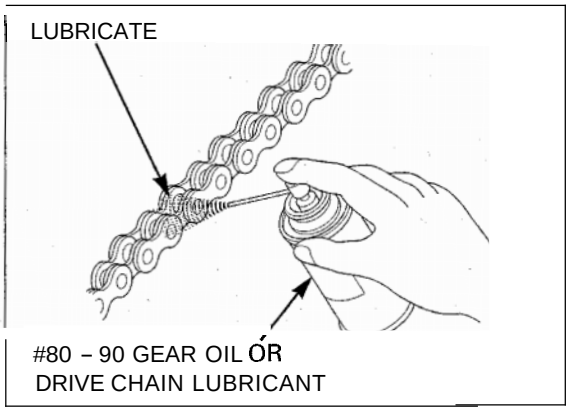
Recheck the drive chain slack and free wheel rotation.
Lubricate the drive chain with #80 – 90 gear oil or drive chain lubricant designed specifically for use with O-ring chains. Wipe *off* the excess oil or chain lubricant.
Check the drive chain wear indicator label attached on the left swingarm.
If the drive chain adjusting plate index mark reaches the red zone of the indicator label, replace the drive chain with a new one (page 3-22).

CLEANING AND LUBRICATION

Clean the chain with non-flammable or high flash-point solvent and wipe it dry.
Be sure the chain has dried completely before lubricating.
Inspect the drive chain for possible damage or wear.
Replace any chain that has damaged rollers, loose fitting links, or otherwise appears unserviceable.
Installing a new chain on badly worn sprockets will cause the new chain to wear quickly.
Inspect and replace the sprocket as necessary.

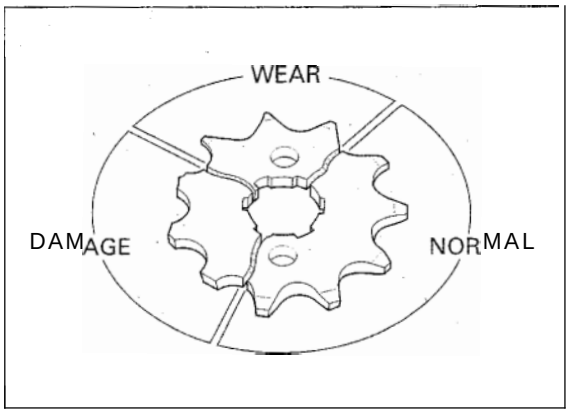


Lubricate the drive chain with #80 – 90 gear oil or drive chain lubricant designed specifically for use with O-ring chains. Wipe off the excess oil or chain lubricant.



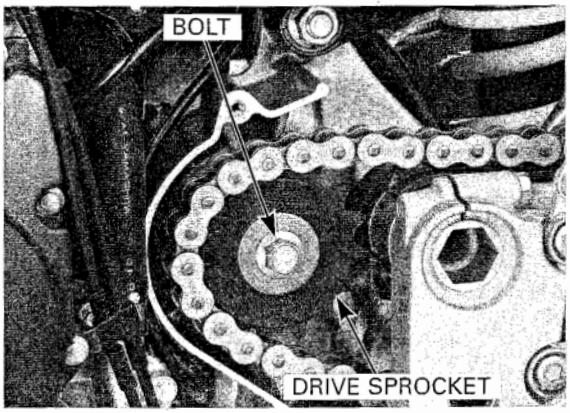
SPROCKETS INSPECTION

Inspect the drive and driven sprocket teeth for wear or damage, replace if necessary.
Never use a new drive chain on worn sprockets.
Both chain and sprockets must be in good condition, or the new replacement chain will wear rapidly.



Check the attaching bolts and nuts on the drive and driven sprockets.
If any are loose, torque them.

TORQUE:
Drive sprocket bolt: 54 N·m (5.5 kgf·m, 40 lbf·ft)
Driven sprocket nut: 64 N·m (6.5 kgf·m, 47 lbf·ft)

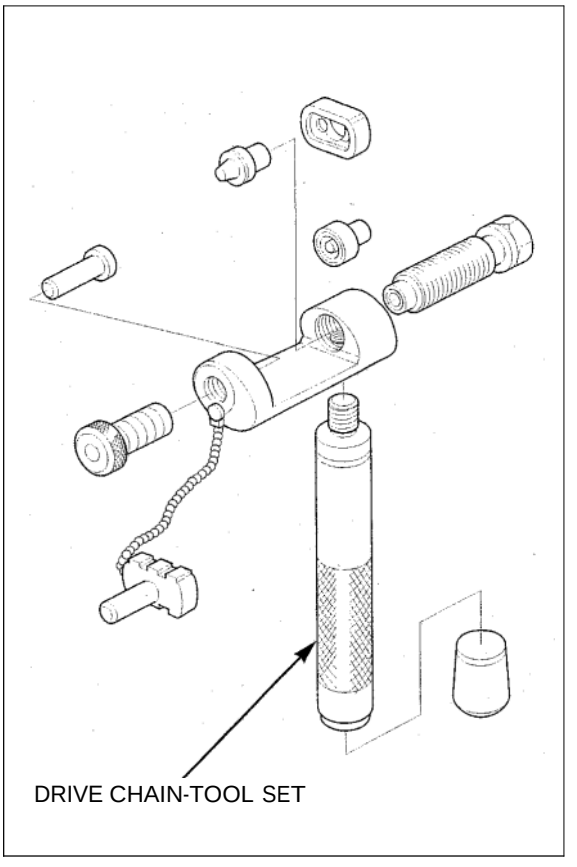


REPLACEMENT

This motorcycle uses a drive chain with a staked master link.
Loosen the drive chain (page 3-20).
Assemble the special tool as shown.

When using the special tool, follow the manufacturer's instruction

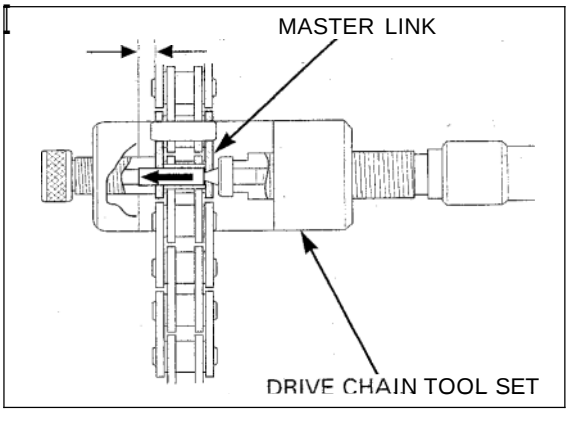
TOOL:
Drive chain tool set — **07HMH-MR10103 or 07HMH–MR1010C (U.S.A. only)**



Locate the crimped pin ends of the master link from the outside of the chain, and remove the link with the drive chain tool set.

TOOL:
Drive chain tool set — **07HMH-MR10103 or 07HMH–MR101OC (U.S.A. only)**

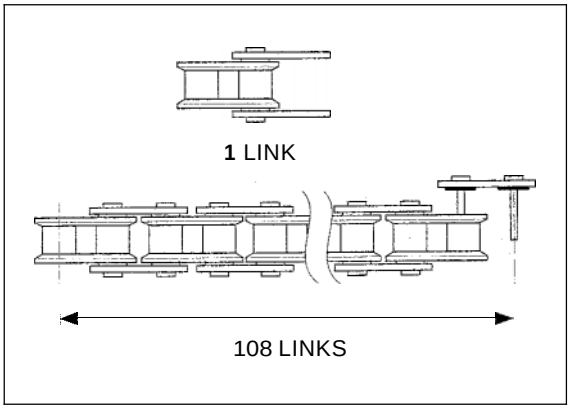
Remove the drive chain.



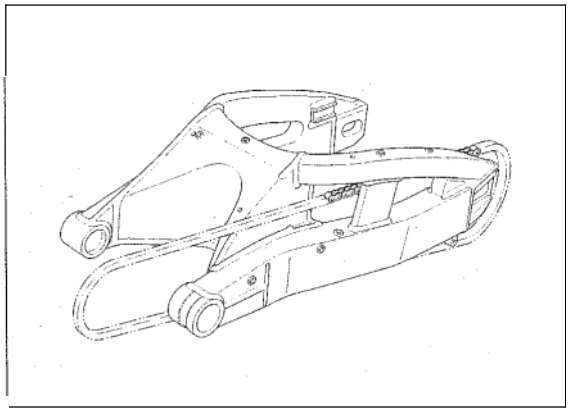
Include the master link when you count the drive chain links

Remove the excess drive chain links from the new drive chain with the drive chain tool set.

STANDARD LINKS: 108 links
REPLACEMENT CHAIN:
DID: DID 50VA8 C1
RK: RK GB50HFOZ5



Route the drive chain through the swingarm as shown.

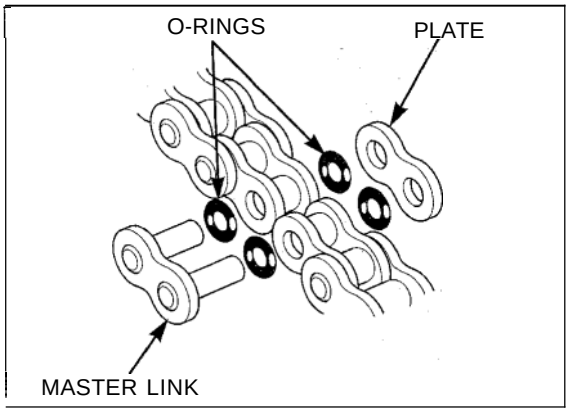


NOTICE

Never reuse the old drive chain, master link, master link plate and O-rings.

insert the master link from the inside of the drive chain, and install the plate with the identification mark facing out

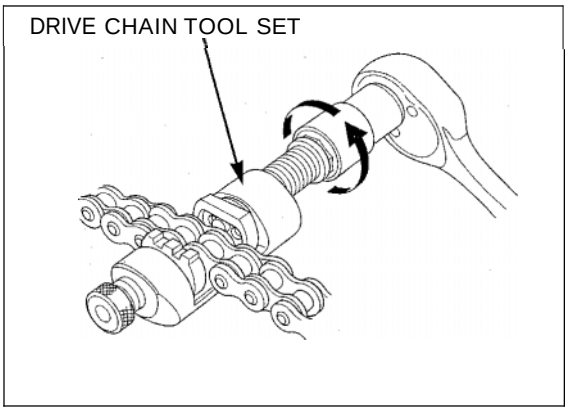
Assemble the new master link, O-rings and plate.



Assemble and set the drive chain tool set.

TOOL:

Drive chain tool set	**07HMH-MR10103 or 07HMH–MR101OC (U.S.A. only)**



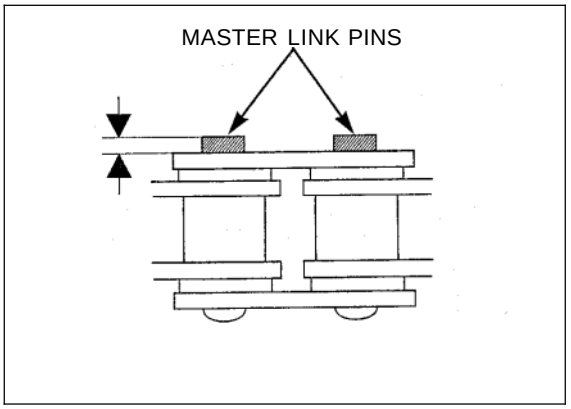
Make sure the master link pins are installed properly. Measure the master link pin length projected from the plate.

STANDARD LENGTH:

DID: 1.15 – 1.55 mm (0.045 – 0.061 in)

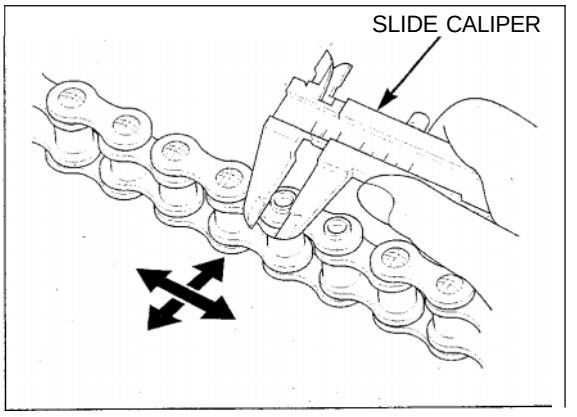
RK: 1.2 – 1.4 mm (0.05 – 0.06 in)

Stake the master link pins.



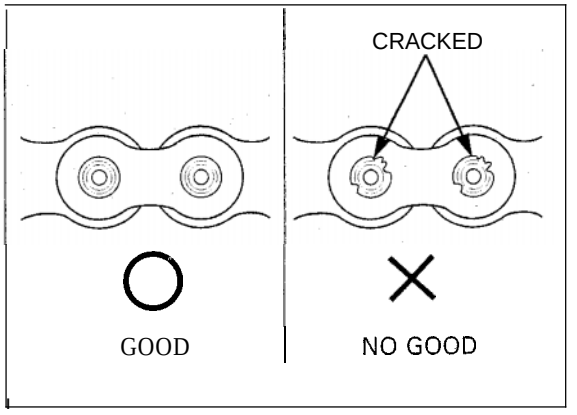
Make sure the pins are staked properly by measuring the diameter of the staked area using a slide caliper.

DIAMETER OF THE STAKED AREA:
DID: 5.50 – 5.80 mm (0.217– 0.228 in)
RK: 5.45– 5.85 mm (0.215– 0.230 in)



A drive chain with a dip-type master link must not be used

After staking, check the staked area of the master link for cracks.
If there is any cracking, replace the master link, O-rings and plate.

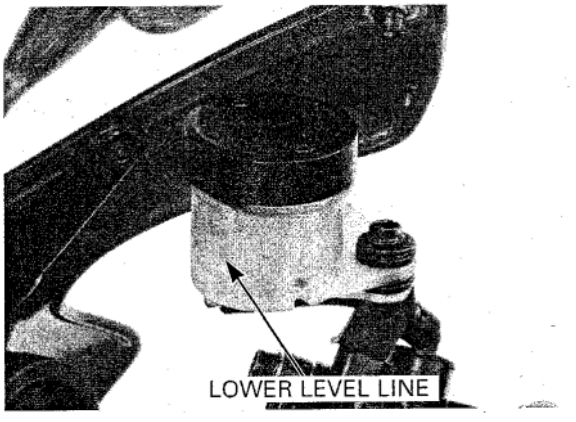


BRAKE FLUID

NOTICE

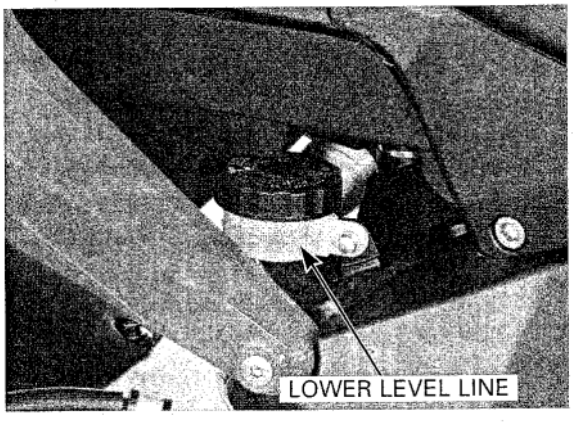
- *Do not mix different types of fluid, as they are not compatible with each other.*
- *Do not allow foreign material to enter the system when filling the reservoir.*
- *Avoid spilling fluid on painted, plastic or rubber parts. Place a rag over these parts whenever the system is serviced.*

When the fluid level is low, check the brake pads for wear (page 3-25). A low fluid level may be due to wear of the brake pads. If the brake pads are worn, the caliper piston is pushed out, and this accounts for a low reservoir level. If the brake pads are not worn and the fluid level is low, check entire system for leaks (page 3-25).



FRONT BRAKE

Turn the handlebar so the reservoir is level and check the front brake fluid reservoir level.
If the level is near the lower level line, check the brake pad wear (page 3-25).



REAR BRAKE

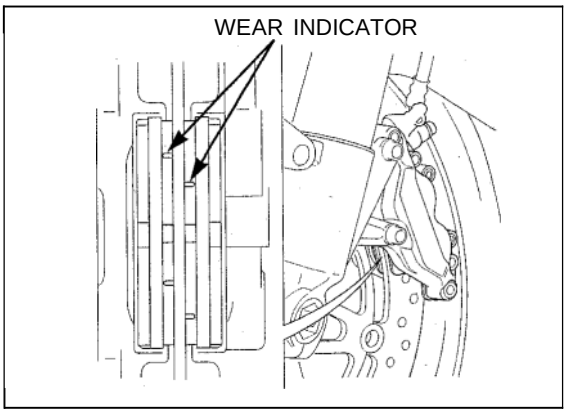
Place the motorcycle on a level surface, and support it in an upright position.
Check the rear brake fluid reservoir level.
If the level is near the lower level line, check the brake pad wear (page 3-25).

BRAKE PAD WEAR

FRONT BRAKE PADS

Check the brake pads for wear.
Replace the brake pads if either pad is worn to the bottom of the wear limit groove.

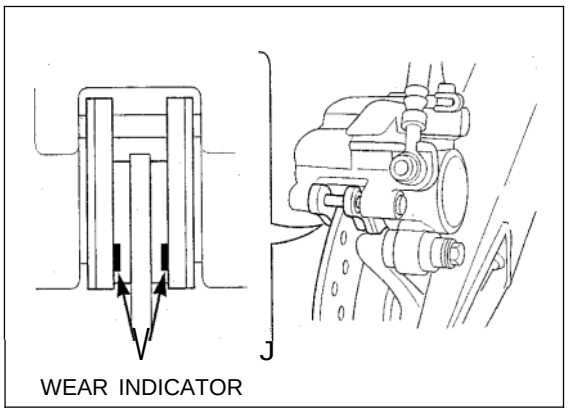
Refer to page 15-8 for brake pad replacement.



REAR BRAKE PADS

Check the brake pads for wear.
Replace the brake pads if either pad is worn to the bottom of the wear limit groove.

Refer to page 15-10 for brake pad replacement.



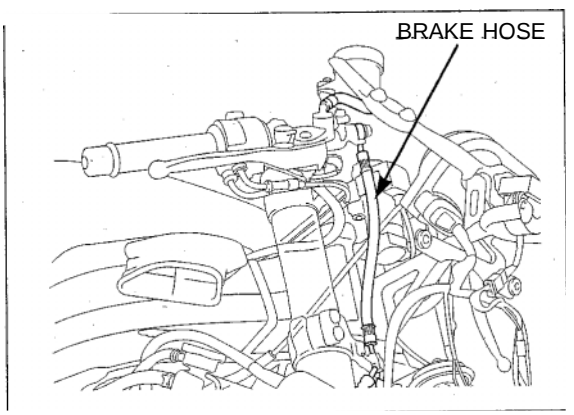
BRAKE SYSTEM

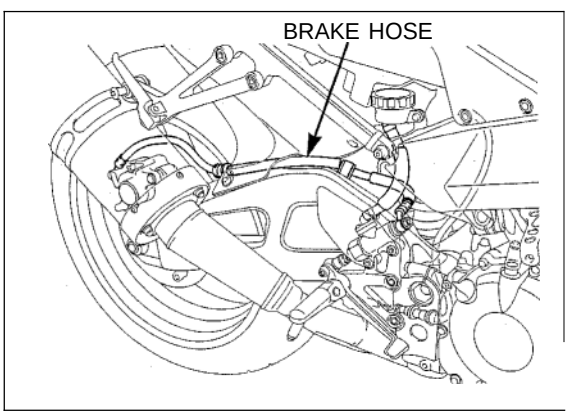
INSPECTION

Firmly apply the brake lever or pedal, and check that no air has entered the system.
If the lever or pedal feels soft or spongy when operated, bleed the air from the system.

Inspect the brake hose and fittings for deterioration, cracks and signs of leakage.
Tighten any loose fittings.
Replace hoses and fittings as required.

Refer to page 15-5 for brake bleeding procedures.

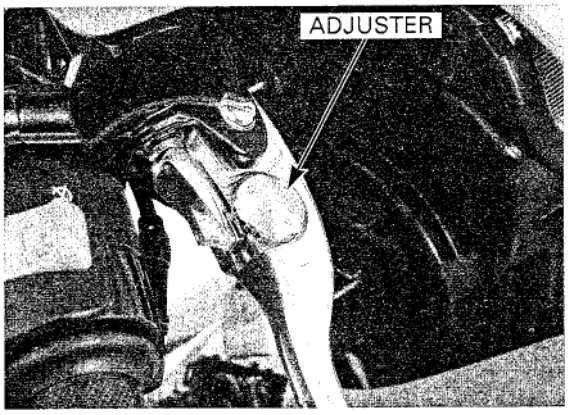




BRAKE LEVER ADJUSTMENT

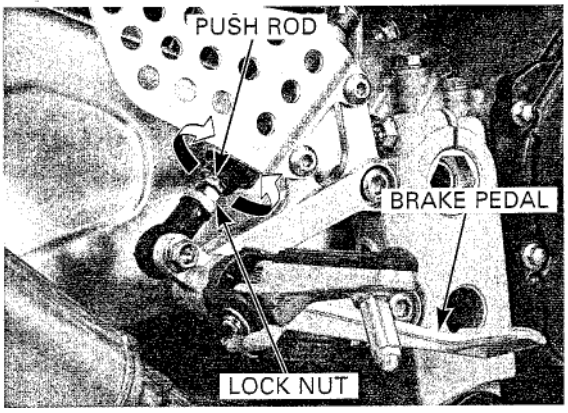
Align the allowance on the brake lever with the index number on the adjuster.

The distance between the top of the brake lever and the grip can be adjusted by turning the adjuster.



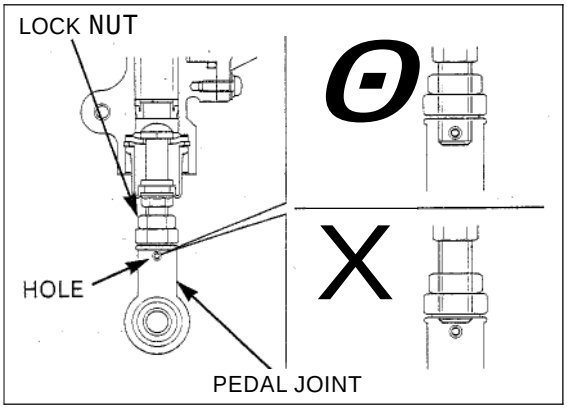
BRAKE PEDAL HEIGHT ADJUSTMENT

Loosen the lock nut and turn the push rod until the correct pedal height is obtained.



Make sure the push rod threads cannot be seen through the pedal joint hole.
After adjustment, tighten the lock nut to the specified torque.

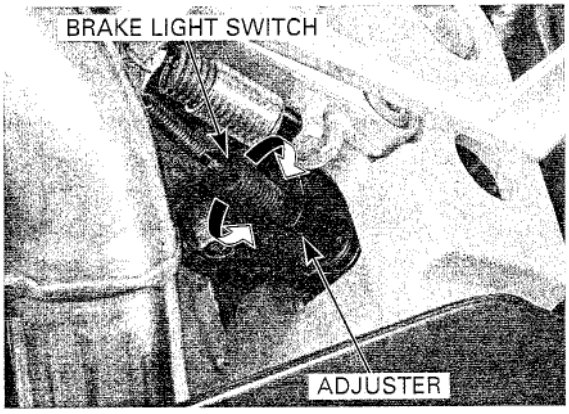
TORQUE: 18 N•m (1.8kgf•m, 13 lbf•ft)



BRAKE LIGHT SWITCH

The front brake light switch does not require adjustment.

Adjust the brake light switch so the brake light comes on just prior to the brake actually being engaged.
If the light fails to come on, adjust the switch so the light comes on at the proper time.
Hold the switch body and turn the adjuster. Do not turn the switch body.



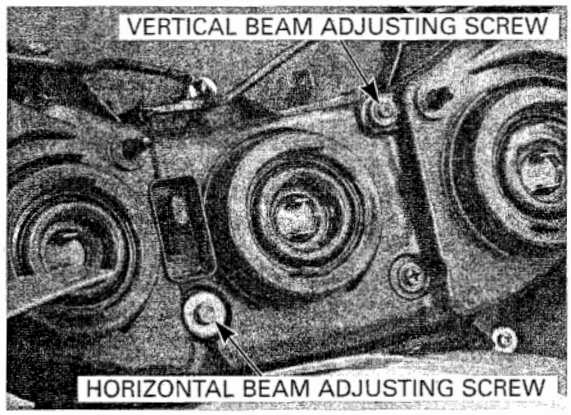
HEADLIGHT AIM

Adjust the headlight beam as specified by local laws and regulations

Place the motorcycle on a level surface.

Adjust the headlight beam vertically by turning the vertical beam adjuster.
A clockwise rotation moves the beam up and counterclockwise rotation moves the beam down.

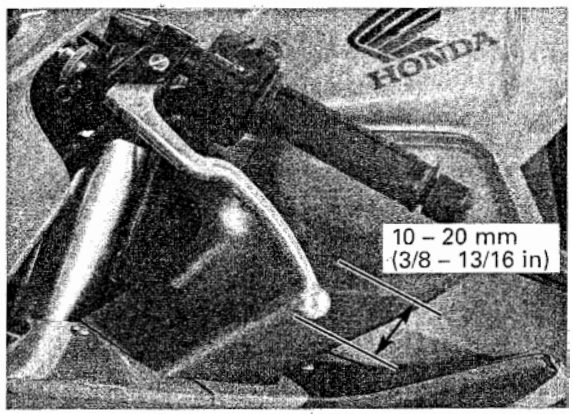
Adjust the headlight beam horizontally by turning the horizontal beam adjuster
A clockwise rotation moves the beam toward the right side of the rider.



CLUTCH SYSTEM

Measure the clutch lever free play at the end of the clutch lever.

FREE PLAY: 10 – 20 mm (3/8 – 13/16 in)

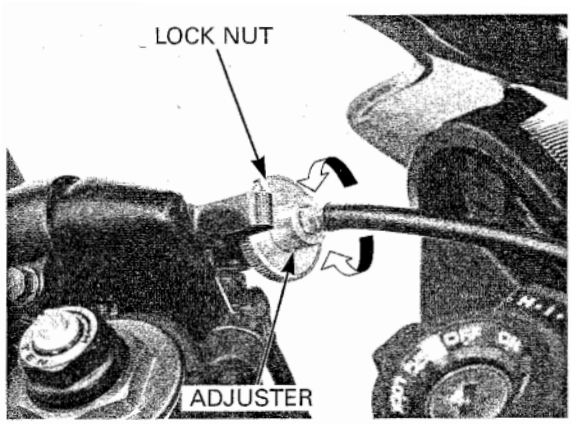


Minor adjustments are made using the upper adjuster at the clutch lever.
Loosen the lock nut and turn the adjuster.

NOTICE

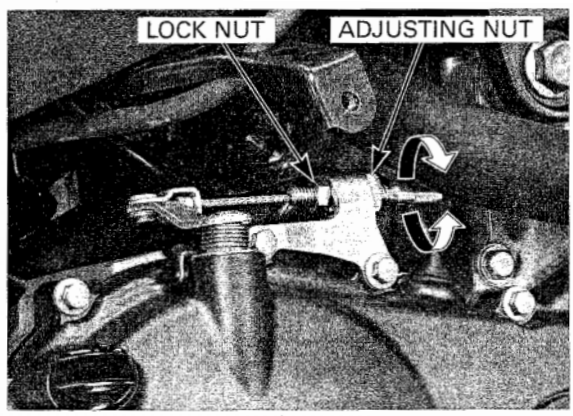
The adjuster may be damaged if it is positioned too far out, leaving minimal thread engagement.

If the adjuster is threaded out near its limit and the correct free play cannot be obtained, turn the adjuster all the way in and back out one turn.
Tighten the lock nut and make a major adjustment as described below.

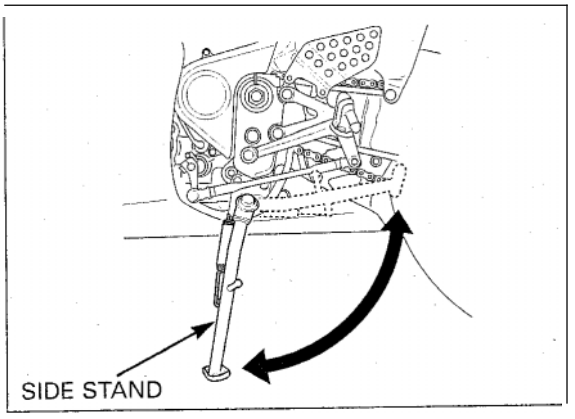


Major adjustments are performed at the clutch arm.
Loosen the lock nut and turn the adjusting nut to adjust free play.
Hold the adjusting nut securely while tightening the lock nut.

If proper free play cannot be obtained, or the clutch slips during test ride, disassemble and inspect the clutch (see section 9).



SIDE STAND

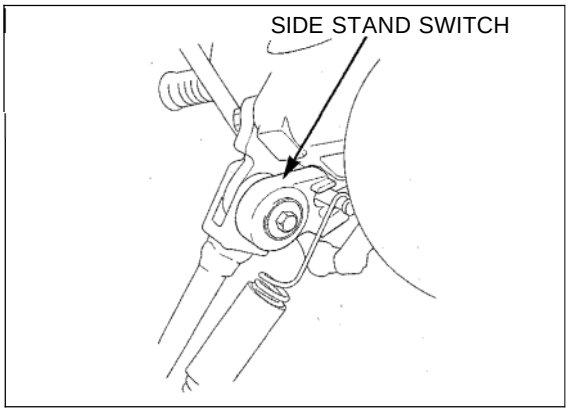


Support the motorcycle on a level surface.

Check the side stand spring for damage or loss of tension.
Check the side stand assembly for smooth movement and lubricate the side stand pivot if necessary.

Check the side stand ignition cut-off system:
- Sit astride the motorcycle and raise the side stand.
- Start the engine with the transmission in neutral, then shift the transmission into gear, with the clutch lever squeezed.
- Move the side stand completely down.
- The engine should stop as the side stand is lowered.

If there is a problem with the system, check the side stand switch (section 19).



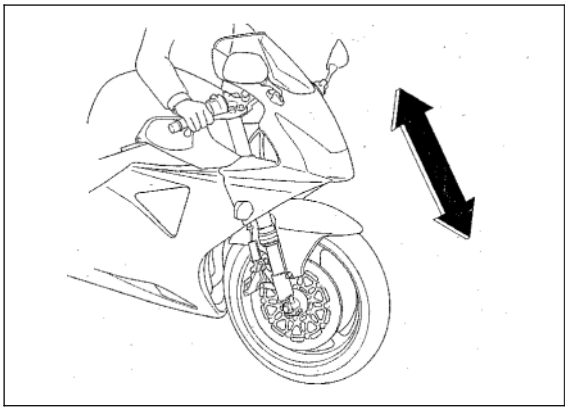
SUSPENSION

FRONT SUSPENSION INSPECTION

Loose, worn or damaged suspension parts *impair motorcycle stability and control.*

Check the action of the forks by operating the front brakes and compressing the front suspension several times.
Check the entire assembly for signs of leaks, damage or loose fasteners.
Replace damaged components which cannot be repaired.
Tighten all nuts and bolts.

Refer to section 13 for fork service.



FRONT SUSPENSION ADJUSTMENT

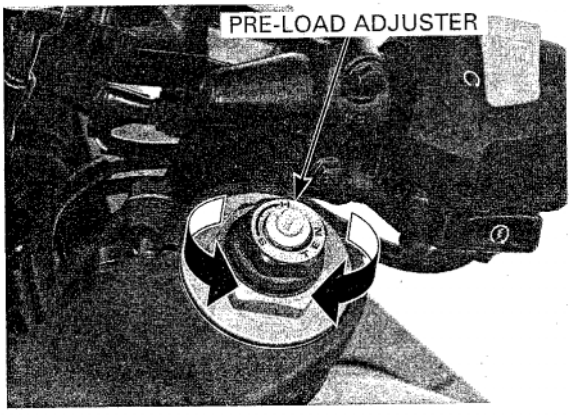
To adjust both *sides equally, set* the *right and left damping adjusters to* the *same position*

SPRING PRE-LOAD ADJUSTER

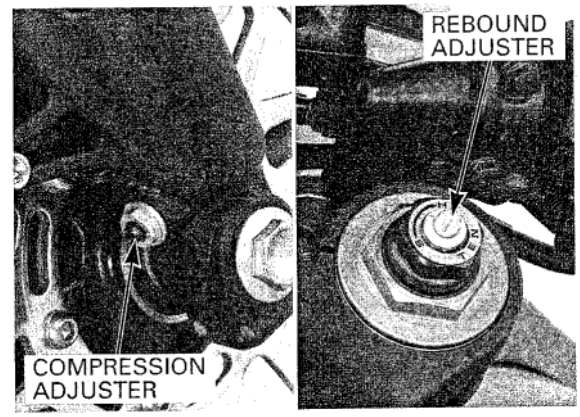
Spring pre-load can be adjusted by turning the adjuster.

TURN CLOCKWISE:
Increase the spring pre-load
TURN COUNTERCLOCKWISE:
Decrease the spring pre-load

PRE-LOAD ADJUSTER STANDARD POSITION:
7 turns from full soft



COMPRESSION AND REBOUND DAMPING ADJUSTERS



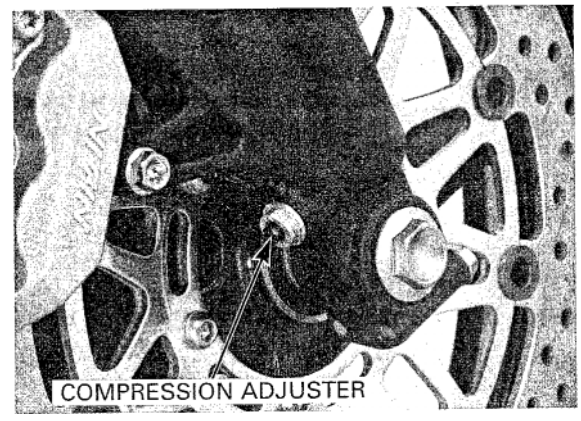
NOTICE

Do not turn the adjuster screws more than the given positions or the adjusters may be damaged.

Always start on full hard when adjusting the damping. Be sure that the rebound and compression adjusters are firmly located in a detent, and not between positions.

The compression and rebound damping can be adjusted by turning the adjusters.

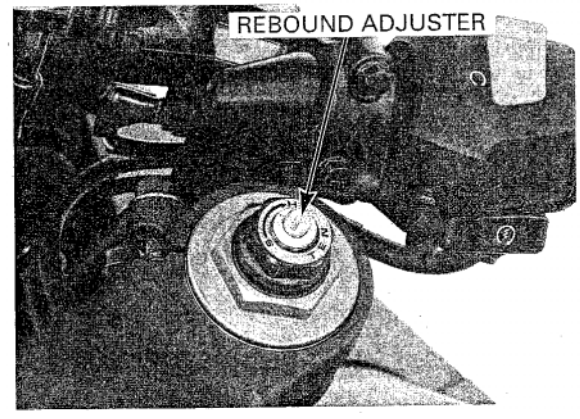
DIRECTION H: Increase the damping force
DIRECTION S: Decrease the damping force



Turn the compression adjuster clockwise until it stops, then turn the adjuster counterclockwise.

COMPRESSION ADJUSTER STANDARD POSITION:
2 turns from full hard

Turn the rebound adjuster clockwise until it stops, then turn the adjuster counterclockwise.

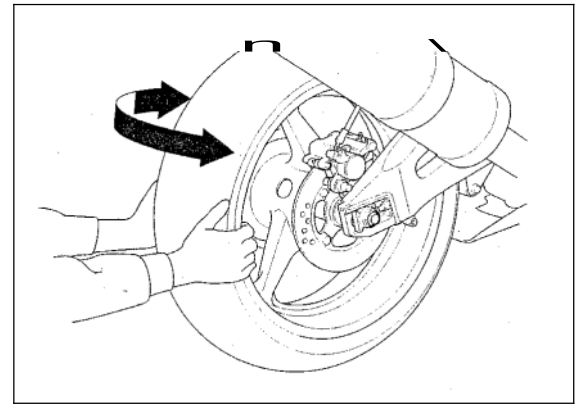


REBOUND ADJUSTER STANDARD POSITION:
2 turns from full hard

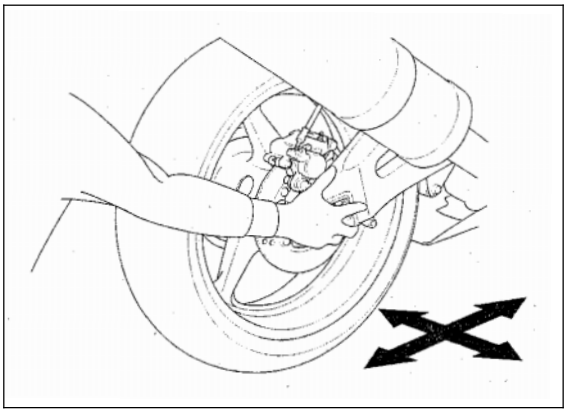
REAR SUSPENSION INSPECTION

Support the motorcycle securely and raise the rear wheel off the ground.

Hold the swingarm and move the rear wheel sideways with force to see if the wheel bearings are worn.

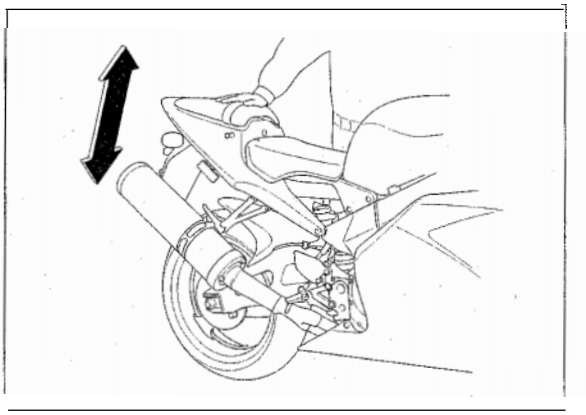


Check for worn swingarm bearings by grabbing the rear swingarm and attempting to move the swingarm side to side.
Replace the bearings if any looseness is noted.



Check the action of the shock absorber by compressing it several times.
Check the entire shock absorber assembly for signs of leaks, damage or loose fasteners.
Replace damaged components which cannot be repaired.
Tighten all nuts and bolts.

Refer to section 14 for shock absorber service.



REAR SUSPENSION ADJUSTMENT

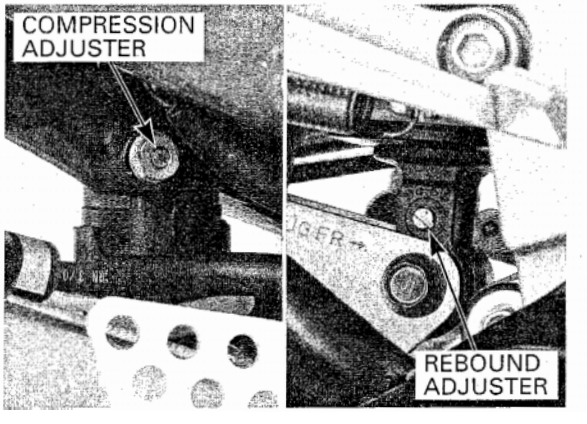
COMPRESSION AND REBOUND DAMPING ADJUSTERS

NOTICE

Do not turn the adjuster screws more than the given positions or the adjusters may be damaged.

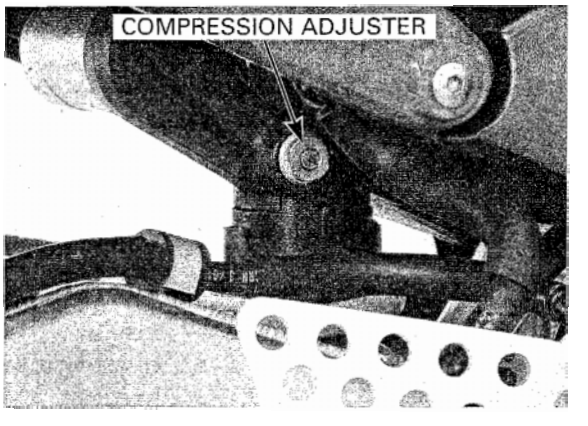
Always start on full hard when adjusting the damping.

The compression and rebound damping can be adjusted by turning the adjusters.



DIRECTION H: Increase the damping force
DIRECTION S: Decrease the damping force

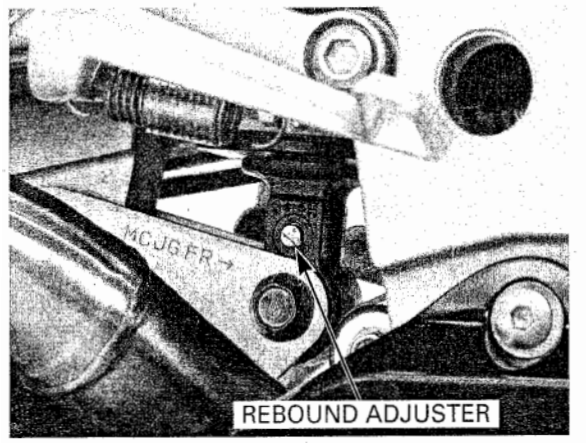
Turn the compression adjuster clockwise until it stops, then turn the adjuster counterclockwise.



COMPRESSION ADJUSTER STANDARD POSITION:
2 turns from full hard

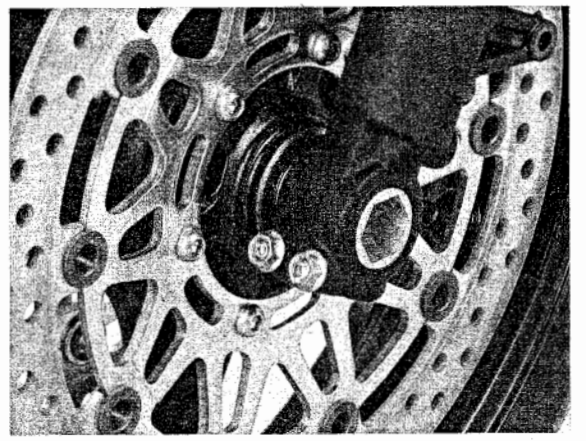
Turn the rebound adjuster clockwise until it stops, then turn the adjuster counterclockwise.

REBOUND ADJUSTER STANDARD POSITION:
2 **turns from full hard**



NUTS, BOLTS, FASTENERS

Check that all chassis nuts and bolts are tightened to their correct torque values (page 1-12).
Check that all safety clips, hose clamps and cable stays are in place and properly secured.

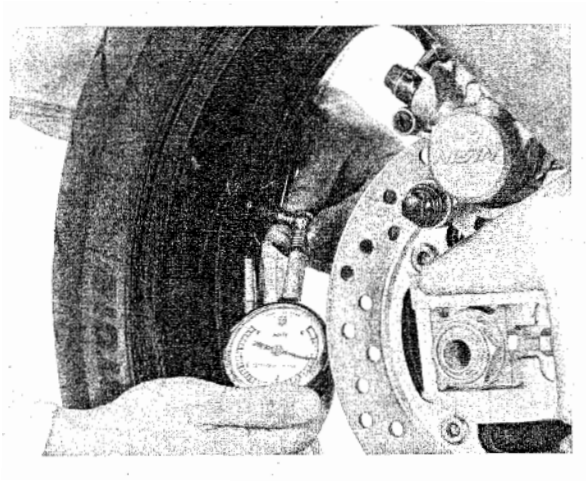


WHEELS/TIRES

The pressure should be checked when the tires are cold.

RECOMMENDED TIRE PRESSURE AND TIRE SIZE:

		FRONT	REAR
Tire pressure kPa (kgf/cm², psi)		250 (2.50, 36)	290 (2.90, 42)
Tire size		120/70 ZR17 M/C (58W)	190/50 ZR17 M/C (73W)
Tire bland	Bridgestone	BT012F RADIAL G	BT012R RADIAL G
	Michelin	Pilot SPORT E	Pilot SPORT E

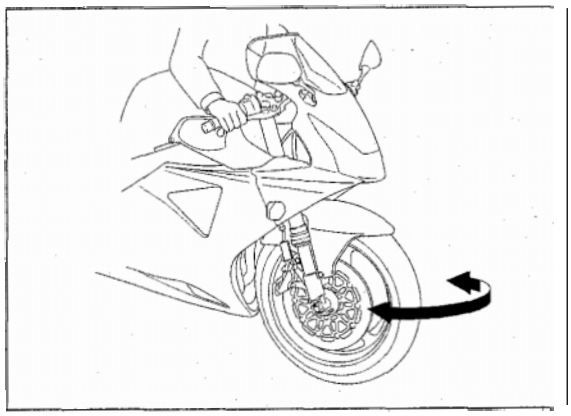


Check the tires for cuts, embedded nails, or other damage.
Check the front and rear wheels for trueness (refer to section 13 and 14).

Measure the tread depth at the center of the tires.
Replace the tires when the tread depth reaches the following limits.

MINIMUM TREAD DEPTH:
FRONT: 1.5 mm (0.06 in)
REAR: 2.0 mm (0.08 in)

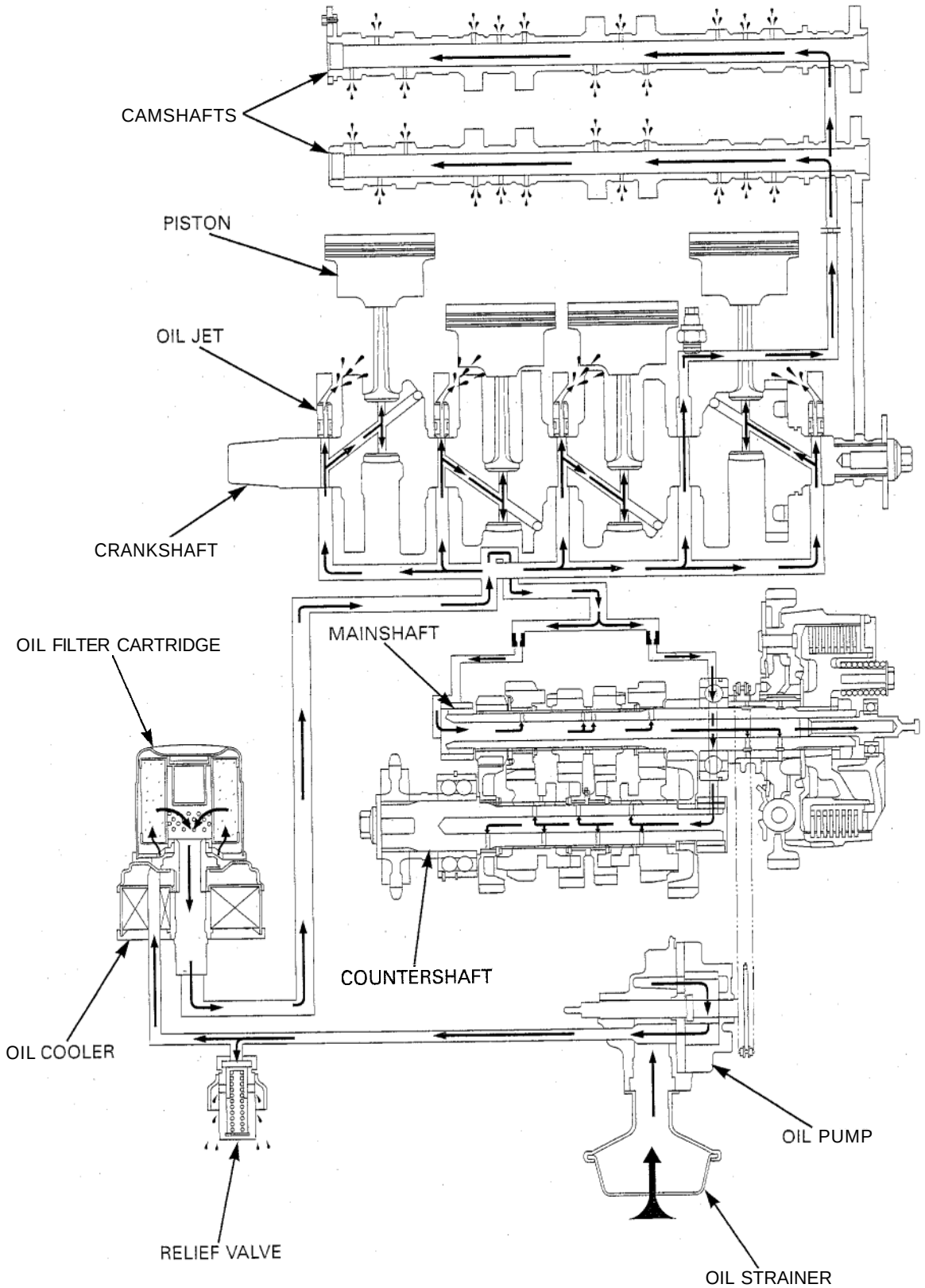
STEERING HEAD BEARINGS



Check that the control cables do not interfere with handlebar rotation.

Support the motorcycle securely and raise the front wheel *off* the ground.
Check that the handlebar moves freely from side to side.
If the handlebar moves unevenly, binds, or has vertical movement, inspect the steering head bearings (Section 13).

LUBRICATION SYSTEM DIAGRAM



4. LUBRICATION SYSTEM

LUBRICATION SYSTEM DIAGRAM	4-0	OIL STRAINER/PRESSURE RELIEF VALVE	4-3
SERVICE INFORMATION	4-1	OIL PUMP	4-5
TROUBLESHOOTING	4-2	OIL COOLER	4-9
OIL PRESSURE INSPECTION	4-3		

SERVICE INFORMATION

GENERAL

⚠ CAUTION

Repeated, prolonged exposure to used motor oil may cause skin cancer.

Wash your hands thoroughly with strong soap as soon as possible after handling used oil.

- The oil pump can be serviced with the engine installed in the frame.
- The service procedures in this section must be performed with the engine oil drained.
- When removing and installing the oil pump, use care not to allow dust or dirt to enter the engine.
- If any portion of the oil pump is worn beyond the specified service limits, replace the oil pump as an assembly.
- After the oil pump has been installed, check that there are no oil leaks and that oil pressure is correct.

SPECIFICATIONS

Unit: mm (

		STANDARD	SERVICE LIMIT
Engine oil capacity	At draining	3.5 liter (3.7 US qt, 3.1 Imp qt)	—
	At oil filter change	3.7 liter (3.9 US qt, 3.3 Imp qt)	
	At disassembly	4.0 liter (4.2 US qt, 3.5 Imp qt)	
Recommended engine oil		Pro Honda GN4 or HP4 (without molybdenum additives) 4-stroke oil or equivalent motor oil API service classification: SG or higher JASO T 903 standard: MA Viscositv: SAE 10W-40	
Oil pressure at oil pressure switch		490 kPa (5.0 kgf/cm², 71 psi) at 5,400 rpm/(80°C/176°F)	—
Oil pump rotor	Tip clearance	0.15 (0.006) max.	0.20 *(0.008)*
	Body clearance	0.15 – 0.22 (0.006 – 0.009)	0.35 (0.014)
	Side clearance	0.02 – 0.07 (0.001 – 0.003)	0.10 (0.004)

TORQUE VALUES

Oil drain bolt	29 N•m (3.0 kgf•m, 22 lbf•ft)	
Oil cooler mounting bolt	74 N•m (7.5 kgf-m, 54 lbf•ft)	
Oil pump assembly flange bolt	8 N•m (0.8 kgf-m, 5.8 lbf•ft)	CT bolt
Oil pump driven sprocket bolt	15 N•m (1.5 kgf•m, 11 lbf•ft)	Apply a locking agent to the threads.
Oil filter cartridge	26 N•m (2.7 kgf-m, 20 lbf•ft)	Apply clean engine oil to the O-ring.
Lower crankcase 20 mm sealing bolt	29 N•m (3.0 kgf-m, 22 lbf•ft)	Apply a locking agent to the threads.

TOOLS

Oil pressure gauge set	07506–3000001	Equivalent commercially available in U.S.A.
Oil pressure gauge attachment	07510–MA70000	
Oil filter wrench	07HAA–PJ70101	or 07HAA–PJ7O100

TROUBLESHOOTING

Engine oil level too low
- Oil consumption
- External oil leak
- Worn piston ring or incorrect piston ring installation
- Worn valve guide or seal

Low or no oil pressure
- Clogged oil orifice
- Incorrect oil being used

No oil pressure
- Oil level too low
- Oil pump drive sprocket broken
- Oil pump damaged (pump shaft)
- Internal oil leak

Low oil pressure
- Clogged oil strainer screen
- Oil pump worn or damaged
- Internal oil leak
- Incorrect oil being used
- Low oil level

High oil pressure
- Plugged oil filter, gallery, or metering orifice
- Incorrect oil being used

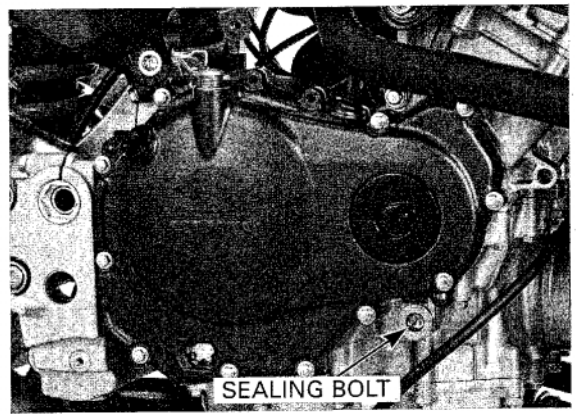
Oil contamination
- From coolant mixing with oil
  - Faulty water pump mechanical seal
  - Faulty cylinder head gasket
  - Water leak in crankcase
  - Faulty oil cooler

OIL PRESSURE INSPECTION

If the oil pressure indicator light remains on a few seconds, check the indicator system before checking the oil pressure.

Check the oil level (page 3-15).

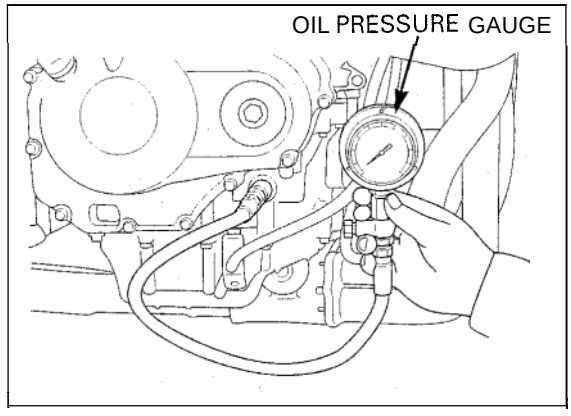
Warm up the engine to normal operating temperature (approximately 80°C/176°F).
Sto'p the engine and remove the crankcase sealing bolt.



Connect an **oil** pressure gauge and attachment to the crankcase.

TOOLS:

Oil pressure gauge set	**07506–3000001 (Equivalent commercially available in U.S.A.)**
Oil pressure gauge attachment	**07510–MA70000 (Equivalent commercially available in U.S.A.)**



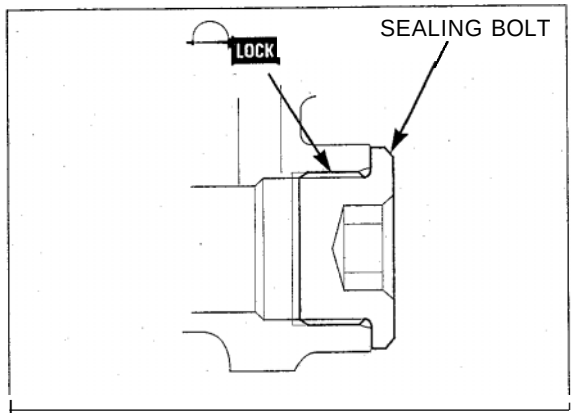
Start the engine and increase the rpm to 5,400 rpm and read the oil pressure.

OIL PRESSURE:
490 kPa (5.0 kgf/cm², 71 psi) at 5,400 rpm/ (80°C/176°F)

Stop the engine and remove the tools.
Apply a locking agent to the sealing bolt threads.

Install and tighten the sealing bolt to the specified torque.

TORQUE: 29 N·m (3.0 kgf·m, 22 lbf·ft)

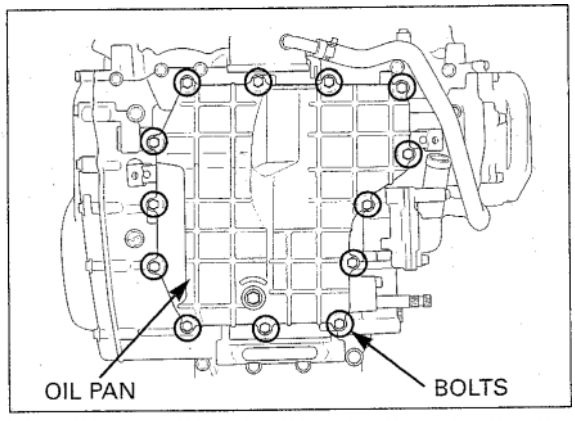


OIL STRAINER/PRESSURE RELIEF VALVE

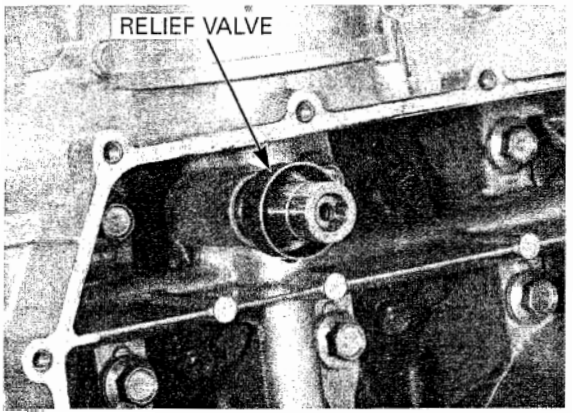
REMOVAL

Drain the engine oil (page 3-15).
Remove the exhaust pipe (page 2-13)

Remove the oil pan flange bolts and oil pan.

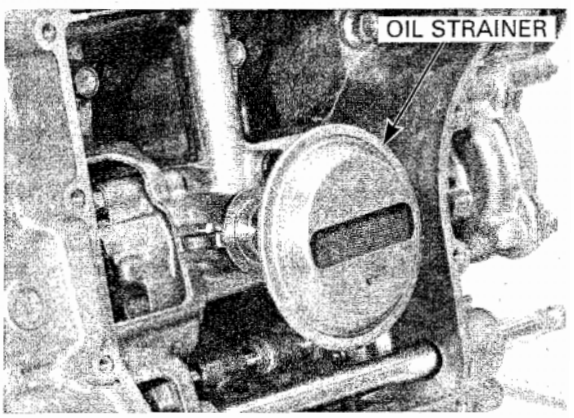


Remove the pressure relief valve and O-ring.



Remove the oil strainer and gasket.

Clean the oil strainer screen.

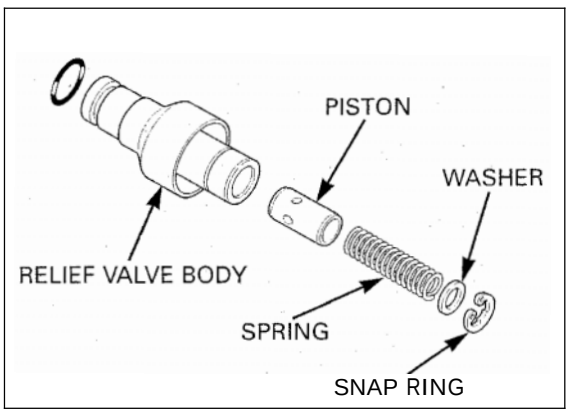


INSPECTION

Check the operation of the pressure relief valve by pushing on the piston.
Disassemble the relief valve by removing the snap ring.

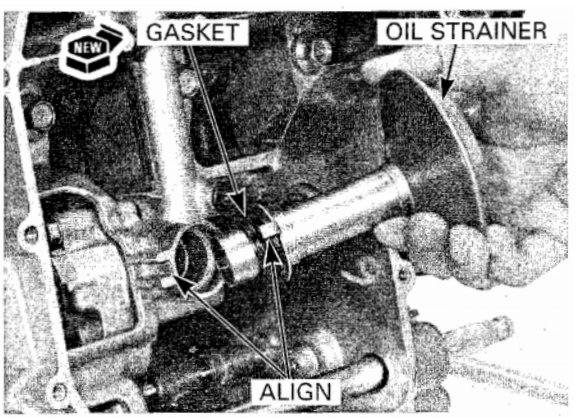
Inspect the piston for wear, unsmooth movement or damage.
Inspect the spring for fatigue or damage.

Assemble the relief valve in the reverse order of disassembly.

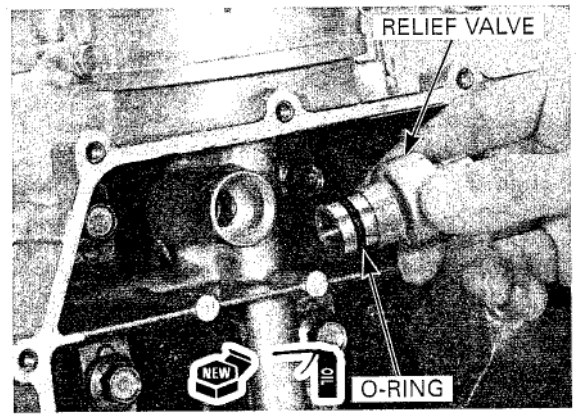


INSTALLATION

Apply oil to the new gasket and install it onto the oil strainer.
Install the oil strainer into the crankcase while aligning its boss with the groove in the crankcase.

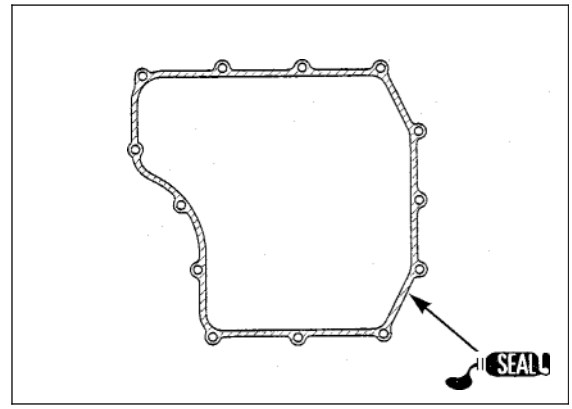


Apply oil to the new O-ring and install it onto the relief valve.
Install the relief valve into the crankcase.



Do not apply sealant more than necessary

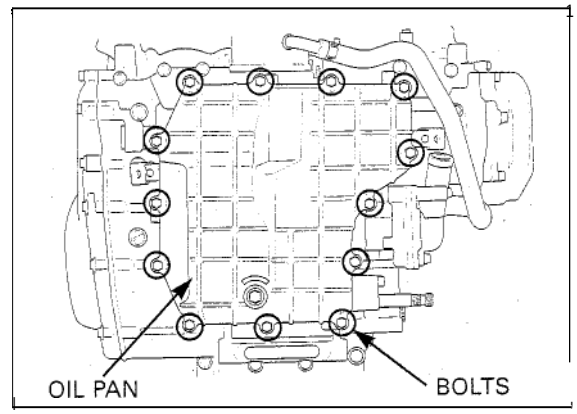
Clean the oil pan mating surface thoroughly.
Apply Three Bond 1207B or an equivalent to the mating surface.



Install the oil pan onto the lower crankcase.
Install the oil pan mounting bolts.
Temporarily tighten the two bolts first, then tighten all the bolts in a crisscross pattern in 2 – 3 steps.

Install the exhaust pipe (page 2-16).
Fill the crankcase with the recommended oil (page 3-16).

After installation, check that there are no oil leaks.

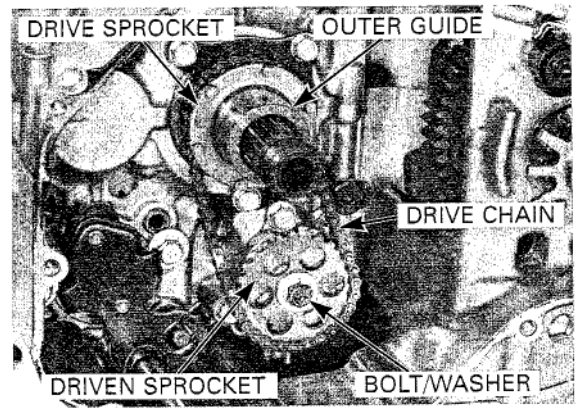


OIL PUMP

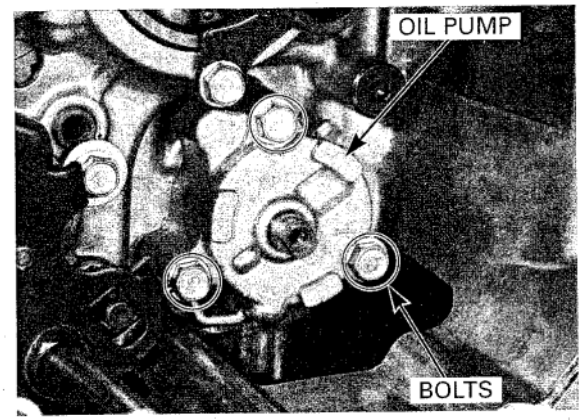
REMOVAL

Remove the following:
- Clutch assembly (page 9-4)
- Oil strainer and pressure relief valve (page 4-3)

Remove the bolt/washer, then remove the oil pump drive/driven sprocket, clutch outer guide and drive chain as an assembly.

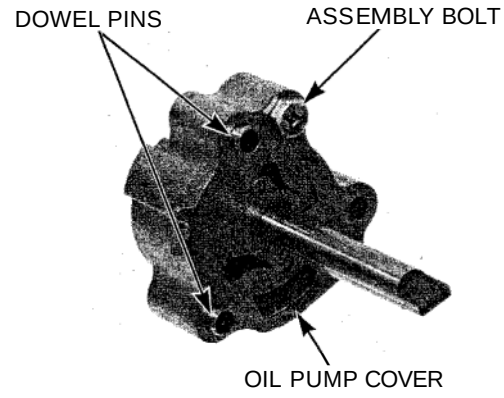


Remove the three flange bolts and oil pump assembly.

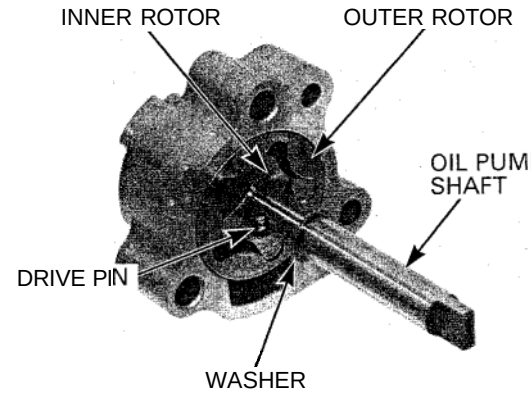


DISASSEMBLY

Remove the dowel pins.
Remove the oil pump assembly bolt and oil pump cover.



Remove the thrust washer, drive pin, oil pump shaft, outer rotor and inner rotor from the oil pump body.

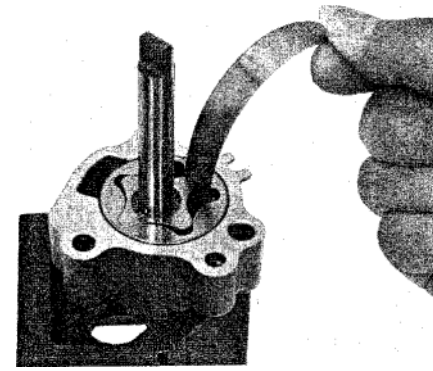


INSPECTION

Temporarily install the oil pump shaft.
Install the outer and inner rotors into the oil pump body.

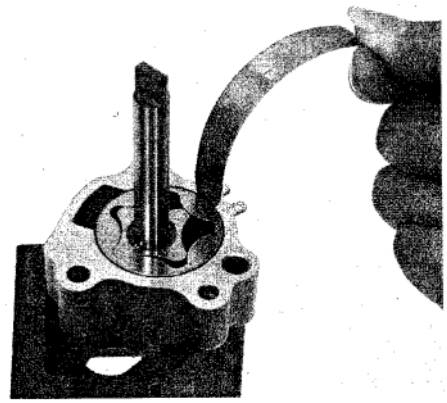
Measure the tip clearance.

SERVICE LIMIT: ***0.20*** **mm** ***(0.008*** **in)**



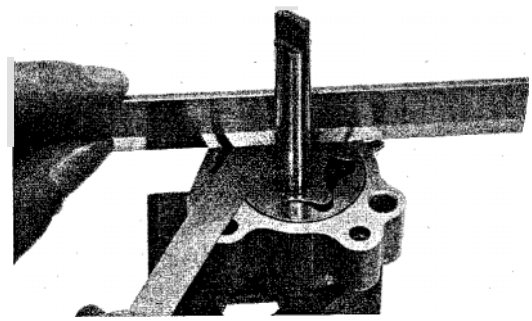
Measure the pump body clearance.

SERVICE LIMIT: 0.35 mm (0.014 in)

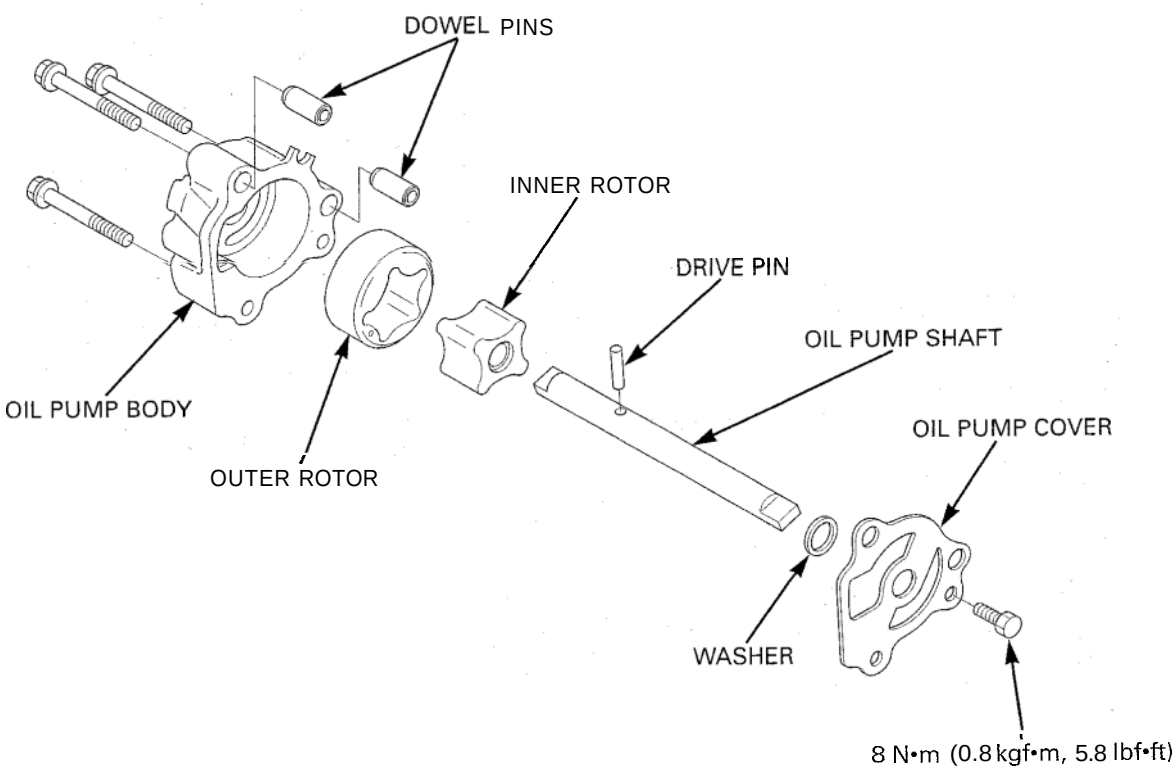


Measure the side clearance using a straight edge and feeler gauge.

SERVICE LIMIT: 0.10 mm (0.004 in)



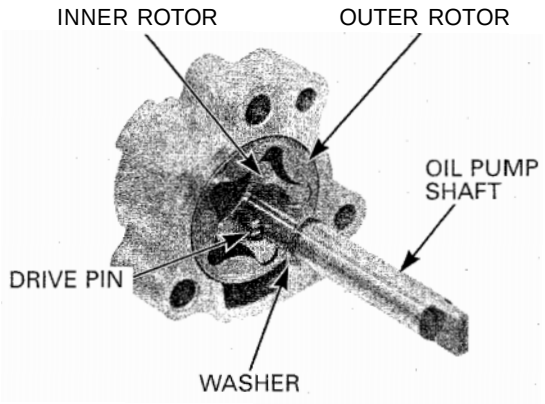
ASSEMBLY



Install the outer rotor with its punch mark facing the oil pump cover.

Install the outer and inner rotors into the oil pump body.
Install the oil pump shaft through the inner rotor and oil pump body.

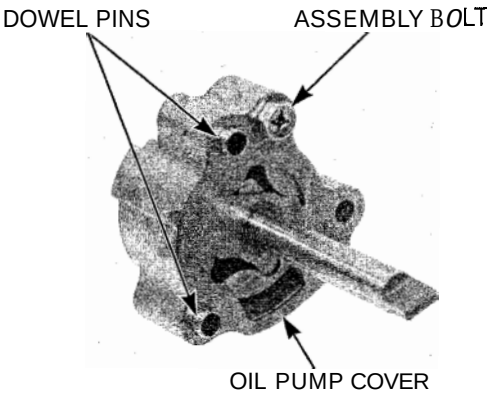
Install the drive pin into the hole in the pump shaft and align the pin with the groove in the inner rotor as shown.
Install the thrust washer.



Install the dowel pins.
Install the oil pump cover and tighten the assembly bolt to the specified torque.

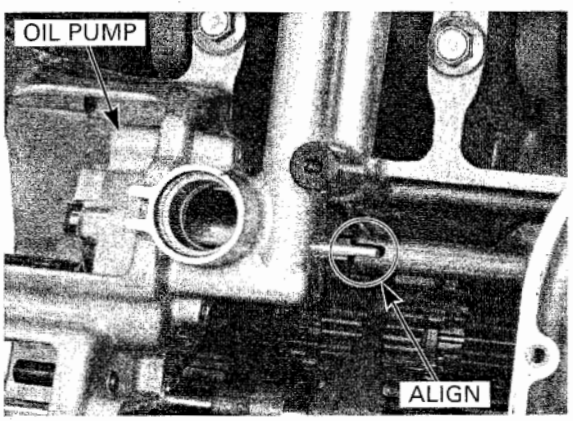
TORQUE: 8 N·m (0.8 kgf·m, 5.8 lbf·ft)

Check the oil pump operation by turning the pump shaft.
If necessary, reassemble the oil pump.

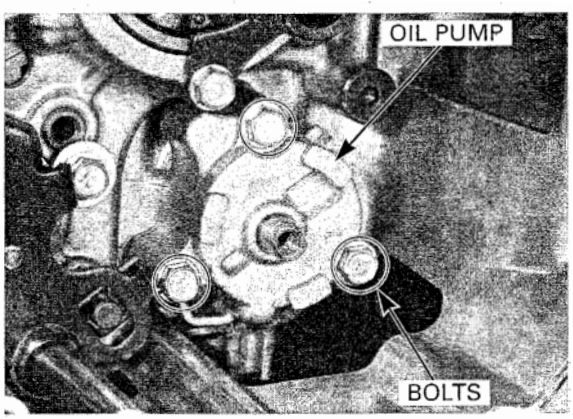


INSTALLATION

Install the oil pump into the crankcase while aligning the pump shaft lug with the water pump shaft groove.



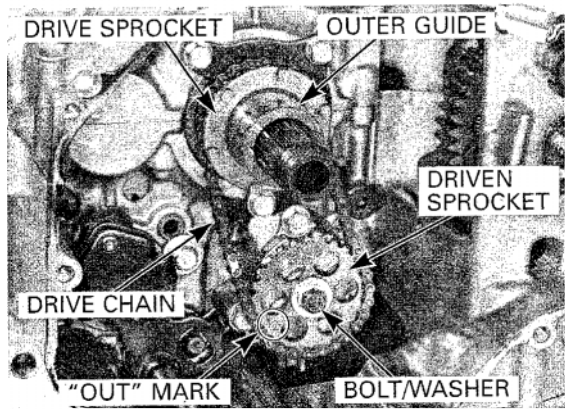
Install and tighten the three flange bolts securely.



Apply oil to the clutch outer guide, oil pump drive sprocket, driven sprocket and drive chain.

Install the oil pump driven sprocket with its "OUT" mark facing outward

Install the clutch outer guide, drive/driven sprocket and drive chain as an assembly.

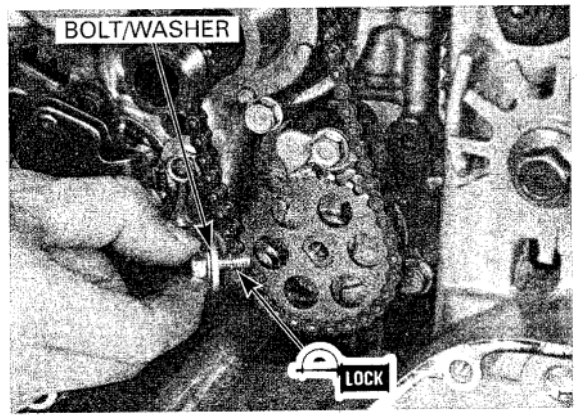


Apply a locking agent to the oil pump driven sprocket bolt threads.
Install and tighten the driven sprocket bolt/washer to the specified torque.

TORQUE: 15 N•m (1.5 kgf•m, 11 lbf•ft)

Install the following:
- Oil strainer/pressure relief valve/oil pan (page 4-41
- Clutch assembly (page 9-9)

After installation, fill the crankcase with the recommended oil and check that there is no oil leaks.
Check the oil pressure (page 4-31.

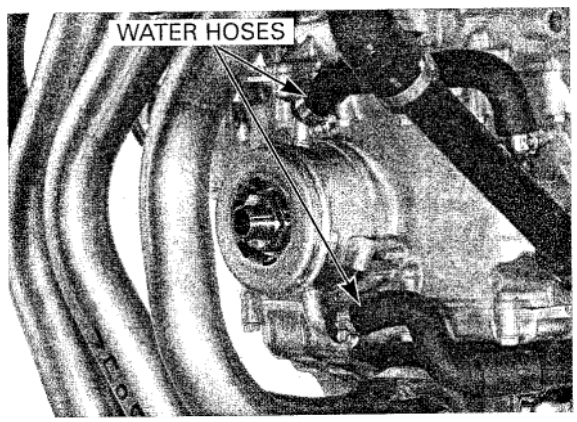


OIL COOLER

REMOVAL

Drain the engine oil and remove the oil filter cartridge (page 3-15).
Drain the coolant from the system (page 6-41.
Remove the radiator reserve tank (page 6-16).

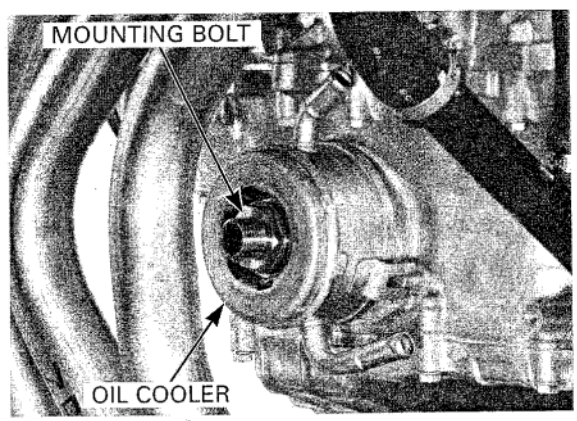
Loosen the hose bands and disconnect the oil cooler water hoses from the cooler.



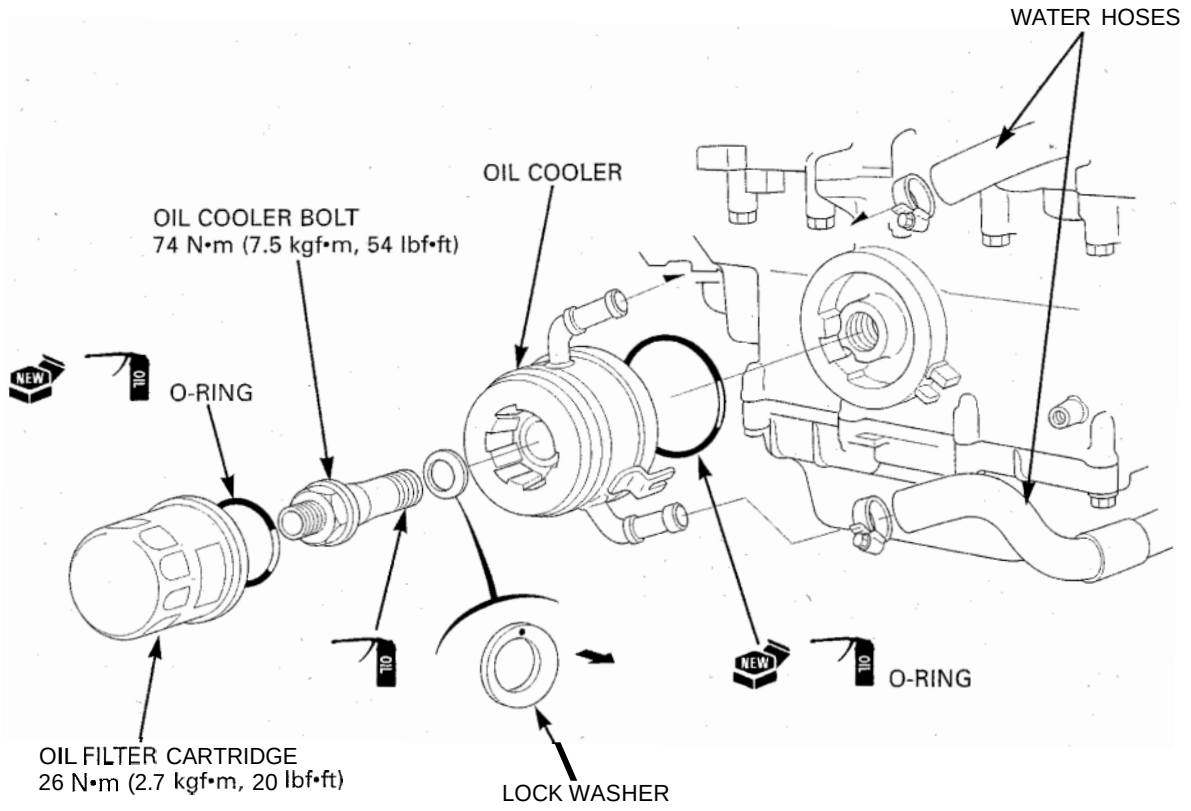
Remove the oil cooler mounting bolt, lock washer and oil cooler.
Remove the O-ring.

INSPECTION

Check the oil cooler for damage.

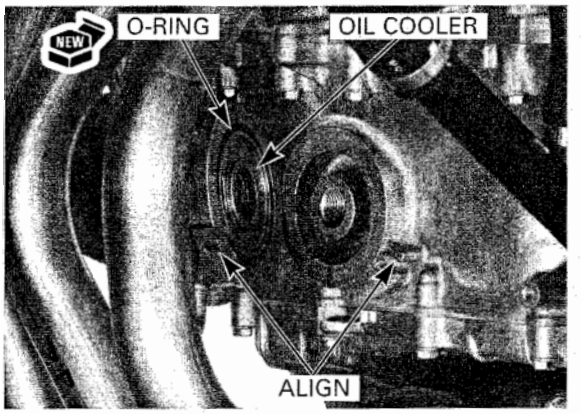


INSTALLATION



Coat a new O-ring with engine oil and install it into the oil cooler groove.

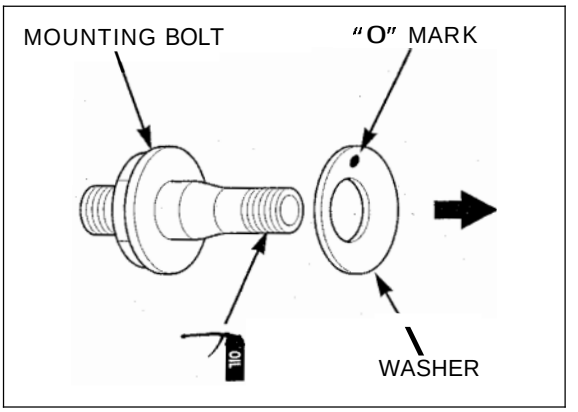
Install the oil cooler aligning its guide groove with the projection on the crankcase.



Apply oil to the oil cooler mounting bolt threads and seating surface.

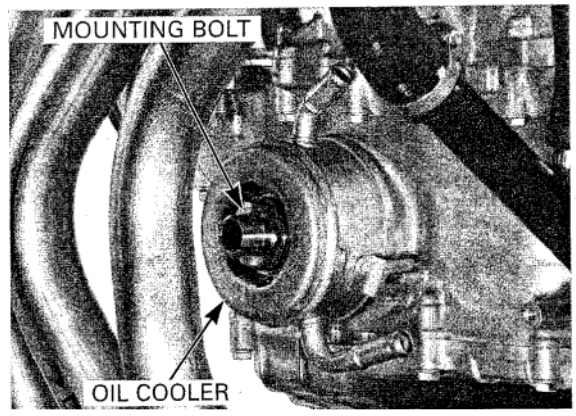
Install the lock washer and oil cooler bolt.

Install the lock washer with its concave side ("O" mark) facing the oil cooler.



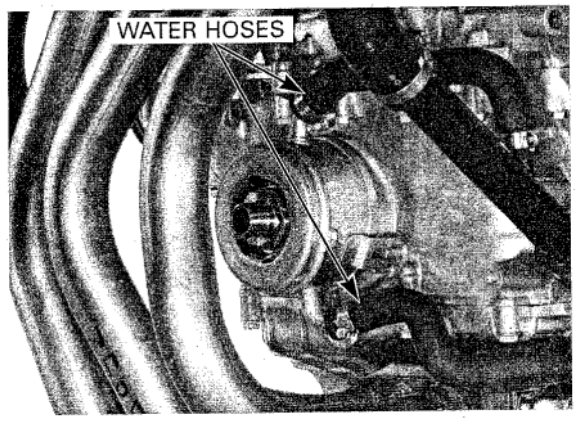
Tighten the oil cooler mounting bolt to the specified torque.

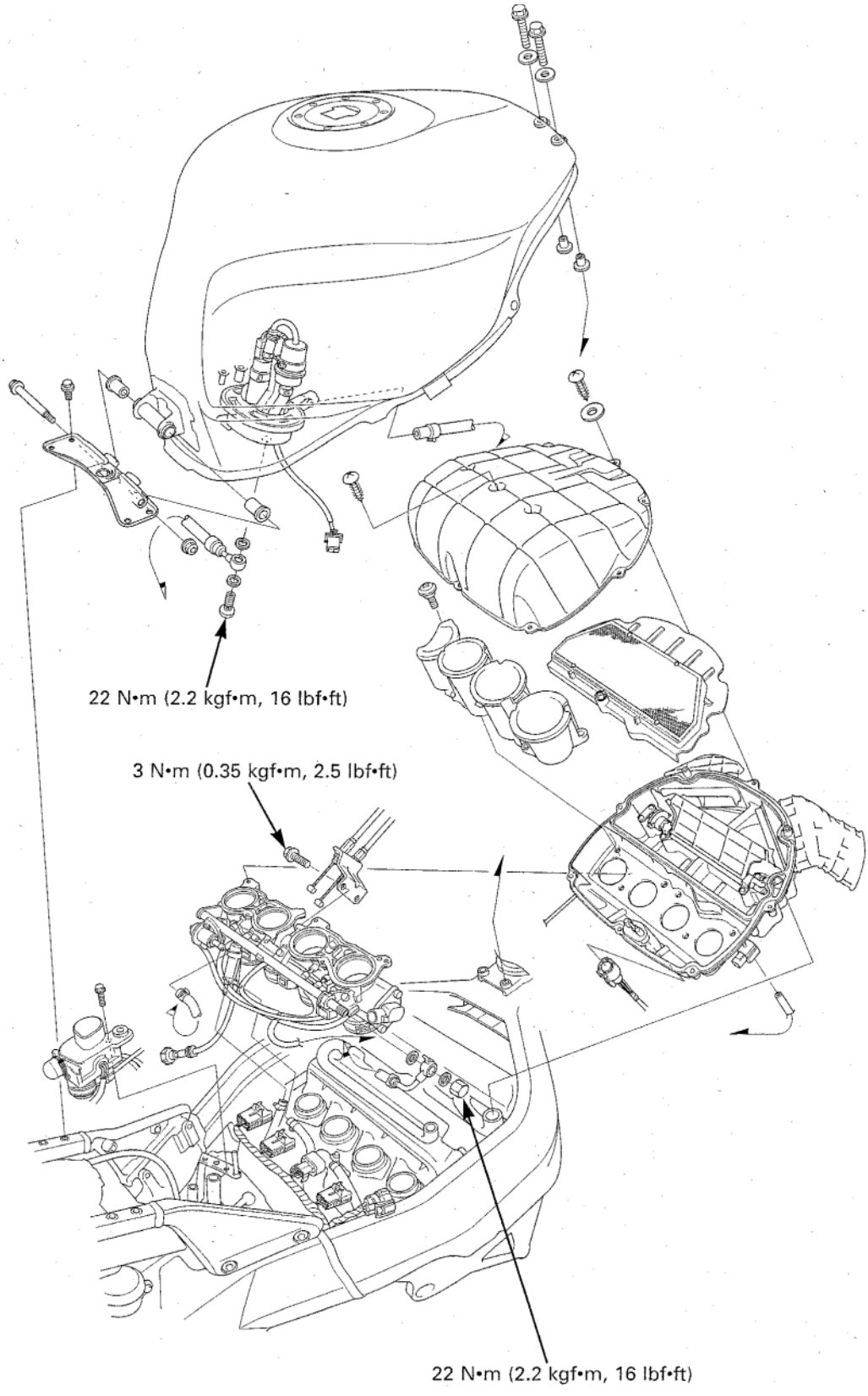
TORQUE: 74 N•m (7.5 kgf•m, 54 lbf•ft)



Connect the oil cooler water hoses, and tighten the hose bands securely.

Install the oil filter cartridge and fill the crankcase with the recommended oil (page 3-16).
Fill the cooling system and bleed any air (page 6-5).




22 N•m (2.2 kgf•m, 16 lbf•ft)
3 N•m (0.35 kgf•m, 2.5 lbf•ft)
22 N•m (2.2 kgf•m, 16 lbf•ft)

5. FUEL SYSTEM (Programmed Fuel Injection)

SERVICE INFORMATION	5-1	MAP SENSOR	5-81
TROUBLESHOOTING	5-3	IAT SENSOR	5-82
SYSTEM LOCATION	5-4	ECT SENSOR	5-82
SYSTEM DIAGRAM	5-5	CAM PULSE GENERATOR	5-83
PGM-FI (PROGRAMMED FUEL INJECTION) SYSTEM	5-6	TP SENSOR	5-84
PGM-FI SELF-DIAGNOSIS MALFUNCTION INDICATOR LAMP (MIL) FAILURE CODES	5-10	BANK ANGLE SENSOR	5-85
FUEL LINE INSPECTION	5-54	ENGINE STOP RELAY	5-86
FUEL PUMP	5-57	ECM (ENGINE CONTROL MODULE)	5-87
FUEL CUT-OFF RELAY	5-58	PAIR SOLENOID VALVE	5-88
FUEL TANK	5-59	EVAP PURGE CONTROL SOLENOID VALVE (California type only)	5-89
AIR CLEANER HOUSING	5-64	O_2 SENSOR (California type only)	5-90
THROTTLE BODY	5-67	EGCV AND AIR INTAKE VALVE INSPECTION	5-92
INJECTORS	5-72	EGCV AND AIR INTAKE VALVE SERVO MOTOR	5-95
PRESSURE REGULATOR	5-74	EGCV	5-97
FAST IDLE WAX UNIT	5-75	VARIABLE AIR INTAKE VALVE	5-104
STARTER VALVE	5-76		
STARTER VALVE SYNCHRONIZATION	5-79		

5

SERVICE INFORMATION

GENERAL

- Be sure to relieve the fuel pressure while the engine is turned to "OFF".
- Bending or twisting the control cables will impair smooth operation and could cause the cables to stick or bind, resulting in loss of vehicle control.
- Work in a well ventilated area. Smoking or allowing flames or sparks in the work area or where gasoline is stored can cause a fire or explosion.

- Do not apply commercially available carburetor cleaners to the inside of the throttle bore, which is coated with molybdenum.
- Do not snap the throttle valve from full open to full closed after the throttle cable has been removed. It may cause incorrect idle operation.
- Seal the cylinder head intake ports with tape or a clean cloth to keep dirt and debris from entering the intake ports after the throttle body has been removed.
- Do not apply excessive force to the fuel pipe on the throttle body while removing or installing the throttle body.
- Do not damage the throttle body. It may cause incorrect throttle and idle valve synchronization.
- Prevent dirt and debris from entering the throttle bore, fuel hose and return hose, clean them using compressed air.
- The throttle body is factory pre-set. Do not disassemble the throttle body in a way other than shown in this manual.
- Do not loosen or tighten the white painted bolts and screws of the throttle body. Loosening or tightening them can cause throttle and idle valve synchronization failure.
- Do not push the fuel pump base under the fuel tank when the fuel tank is stored.
- Always replace the packing when the fuel pump is removed.
- The programmed fuel injection system is equipped with the Self-Diagnostic System described on page 5-6. If the malfunction indicator lamp (MIL) blinks, follow the Self-Diagnostic Procedures to remedy the problem.
- When checking the PGM-FI, always follow the steps in the troubleshooting flow chart (page 5-12 through 5-53).
- The PGM-FI system is provided with a fail-safe function to secure a minimum running capability even when there is no trouble in the system. When any abnormality is detected by the self-diagnosis function, running capability is secured by making use of the numerical values of a situation preset in advance in the simulated program map. It must be remembered, however, that when any abnormality is detected in the four injectors and/or the ignition and cam pulse generator, the fail safe function stops the engine to protect it from damage.
- For PGM-FI system location, see page 5-4.
- A faulty PGM-FI system is often related to poorly connected or corroded connectors. Check those connections before proceeding.
- For fuel reserve sensor inspection, see section 19.
- The vehicle speed sensor sends digital pulse signals to the ECM (PGM-FI unit) for computation. For vehicle speed sensor inspection, see section 19.
- When disassembling the programmed fuel injection parts, note the location of the O-rings. Replace them with new ones upon reassembly.
- Before disconnecting the fuel hose, release the fuel pressure by loosening the fuel hose banjo bolt at the fuel tank.
- Always replace the sealing washers when the fuel hose banjo bolt is removed or loosened.
- Use a digital tester for PGM-FI system inspection.
- EGCV is the abbreviation of Exhaust Gas Control Valve.

SPECIFICATIONS

ITEM		SPECIFICATIONS
Throttle body identification number	Except California type	GQ44C
	California type	GQ44B
Starter valve vacuum difference		20 mm Hg
Base throttle valve for synchronization		No.1
Idle speed		1,200 ± 100 rpm
Throttle grip free play		2 – 6 mm (1/16 – 1/4 in)
Intake air temperature sensor resistance (at 20°C/68°F)		1 – 4 kΩ
Engine coolant temperature sensor resistance (at 20°C/68°F)		2.3 – 2.6 kΩ
Fuel injector resistance (at 20°C/68°F)		10.5 – 14.5 Ω
PAIR solenoid valve resistance (at 20°C/68°F)		20 – 24 Ω
Cam pulse generator peak voltage (at 20°C/68°F)		0.7 V minimum
Ignition pulse generator peak voltage (at 20°C/68°F)		0.7 V minimum
Manifold absolute pressure at idle		150 – 250 mm Hn
Fuel pressure at idle		343 kPa (3.5 kgf/cm², 50 psi)

TORQUE VALUES

ECT (Engine Coolant Temperature)/thermo sensor	23 N•m (2.3 kgf-m, 17 lbf•ft)	
Throttle body insulator band screw	See page 1-14	
Throttle cable bracket mounting screw	3 N•m (0.35 kgf•m, 2.5 lbf•ft)	
Fuel pipe mounting bolt	10 N•m (1.0 kgf•m, 7 lbf•ft)	
Pressure regulator mounting bolt	10 N•m (1.0 kgf•m, 7 lbf•ft)	
Starter valve synchronization plate screw	1 N•m (0.09 kgf-m, 0.7 lbf•ft)	
Fast idle wax unit link plate screw	1 N•m (0.09 kgf•m, 0.7 lbf•ft)	
Fast idle wax unit mounting screw	5 N•m (0.6 kgf•m, 3.6 lbf•ft)	
Starter valve lock nut	2 N•m (0.18 kgf-m, 1.3 lbf•ft)	
Fuel filler cap bolt	2 N•m (0.2 kgf-m, 1.4 lbf•ft)	
Fuel hose banjo bolt (fuel tank side)	22 N•m (2.2 kgf•m, 16 lbf•ft)	
Fuel hose sealing nut (throttle body side)	22 N•m (2.2 kgf•m, 16 lbf•ft)	
Fuel pump mounting nut	12 N•m (1.2 kgf•m, 9 lbf•ft)	See page 5-58 for tightening sequence.
O_2 sensor (California type only)	25 N•m (2.6 kgf•m, 19 lbf•ft)	
EGCV mounting bolt (front)	14 N•m (1.4 kgf•m, 10 lbf•ft)	
(rear)	14 N•m (1.4 kgf•m, 10 lbf•ft)	
EGCV cover mounting bolt	12 N•m (1.2 kgf•m, 9 lbf•ft)	
EGCV pulley nut	12 N•m (1.2 kgf•m, 9 lbf•ft)	
EGCV pulley cover mounting bolt (lower)	12 N•m (1.2 kgf•m, 9 lbf•ft)	

TOOLS

Fuel pressure gauge	07406-0040003 or 07406-004000A (U.S.A. only)
IgnitionMate peak voltage tester (U.S.A. only) or Peak voltage adaptor	07HGJ-0020100 (not available in U.S.A.) with commercially available digital multimeter (impedance 10 MΩ/DCV minimum)
ECM test harness, 26P	070MZ-0010100 (two required)
Vacuum gauge set	07LMJ-001000A
Installer shaft guide	07YMF-MCJ0100 or 07YMF-MCJA100 (U.S.A. only)
Installer shaft	07YMF-MCJ0200 or 07YMF-MCJA200 (U.S.A. only)
Installer shaft, 14 x 30 mm	07YMF-MCJ0300 or 07YMF-MCJA300 (U.S.A. only)
Remover, 14 x 16 mm	07YMF-MCJ0400 or 07YMF-MCJA400 (U.S.A. only)

TROUBLESHOOTING

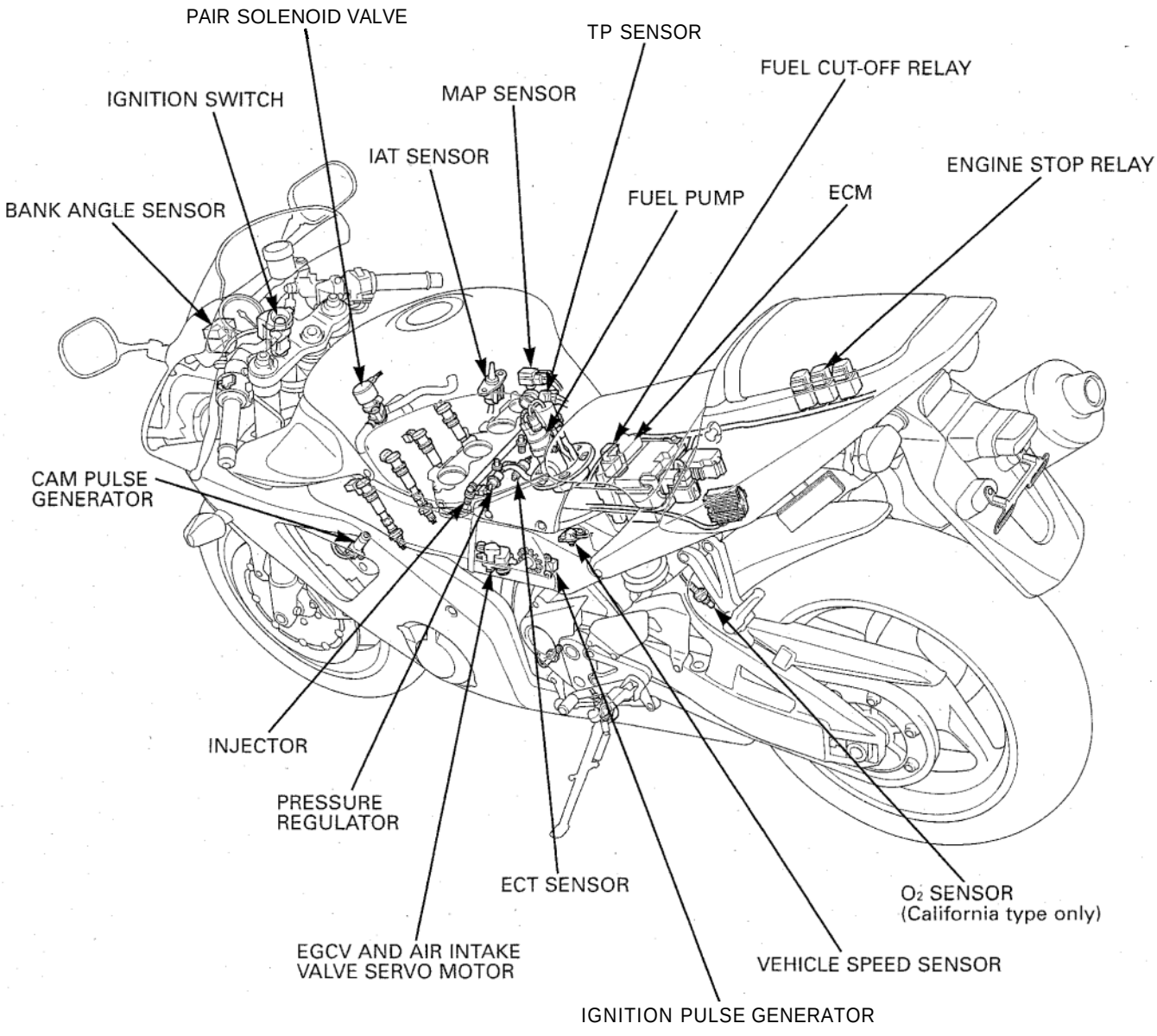
Engine won't to start
- Intake air leak
- Fuel contaminated/deteriorated
- Pinched or clogged fuel hose
- Faulty fuel pump
- Clogged fuel filter
- Clogged fuel injector filter
- Sticking fuel injector needle
- Faulty fuel pump operating system
- Faulty pressure regulator

Engine stall, hard to start, rough idling
- Intake air leak
- Fuel contaminated/deteriorated
- Pinched or clogged fuel hose
- Idle speed misadjusted
- Starter valve synchronization misadjusted
- Faulty pressure regulator

Backfiring or misfiring during acceleration
- Ignition system malfunction

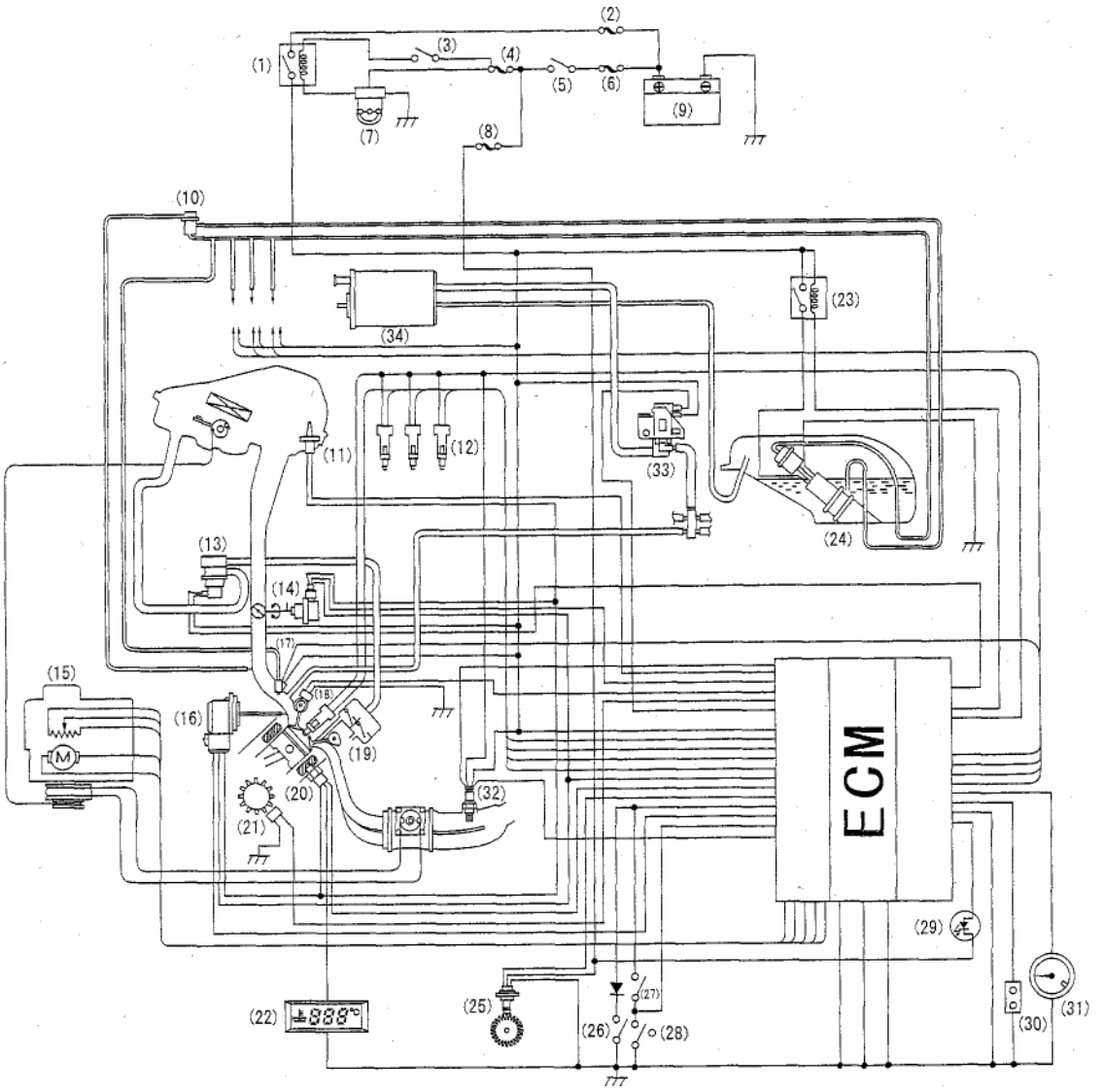
Poor performance (driveability) and poor fuel economy
- Pinched or clogged fuel hose
- Faulty pressure regulator

SYSTEM LOCATION



FULL NAME	ABBREVIATIONS
Manifold absolute pressure sensor	MAP sensor
Throttle position sensor	TP sensor
Intake air temperature sensor	IAT sensor
Engine coolant temperature sensor	ECT sensor
Engine control module	ECM

SYSTEM DIAGRAM



(1)	Engine stop relay
(2)	Main fuse B (20A)
(3)	Engine stop switch
(4)	Sub-fuse (10A)
(5)	Ignition switch
(6)	Main fuse A (30A)
(7)	Bank angle sensor
(8)	Sub-fuse (10A)
(9)	Battery
(10)	Pressure regulator
(11)	IAT sensor
(12)	Direct ignition coil/spark plug
(13)	PAIR solenoid valve
(14)	TP sensor
(15)	EGCV and air intake valve servo motor
(16)	MAP sensor
(17)	Injectors

(18)	Cam pulse generator
(19)	PAIR check valve
(20)	ECT sensor
(21)	Ignition pulse generator
(22)	Water temperature LCD
(23)	Fuel cut-off relay
(24)	Fuel pump
(25)	Vehicle speed sensor
(26)	Neutral switch
(27)	Clutch switch
(28)	Side stand switch
(29)	Malfunction indicator
(30)	Service check connector
(31)	Tachometer
(32)	O_2 sensor (California type only)
(33)	EVAP purge control solenoid valve (California type only)
(34)	EVAP canister (California type only)

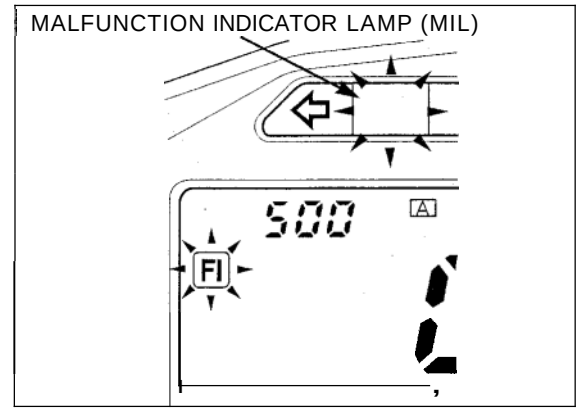
PGM-FI (PROGRAMMED FUEL INJECTION) SYSTEM

SELF-DIAGNOSTIC PROCEDURES

Place the motorcycle on its side stand.
Start the engine and let it idle.

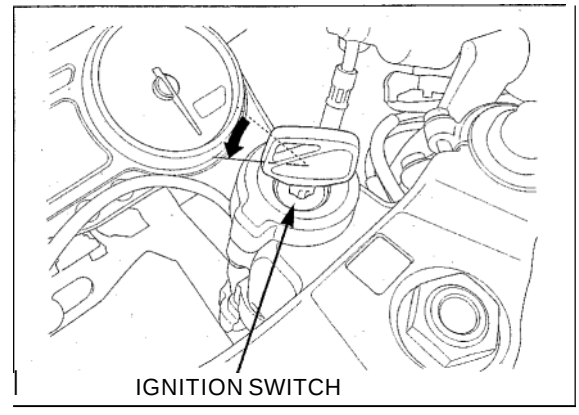
The malfunction indicator lamp (MIL) will start blinking only with the side stand down and with the engine off (engine stop switch in RUN) or engine revs are below 5,000 rpm In any other conditions, the MIL will illuminate and stay on

If the malfunction indicator lamp (MIL) does not light or blink, the system has no memory of problem data. If the malfunction indicator blinks, note how many times the MIL blinks, and determine the cause of the problem (page 5-10 through 5-53).



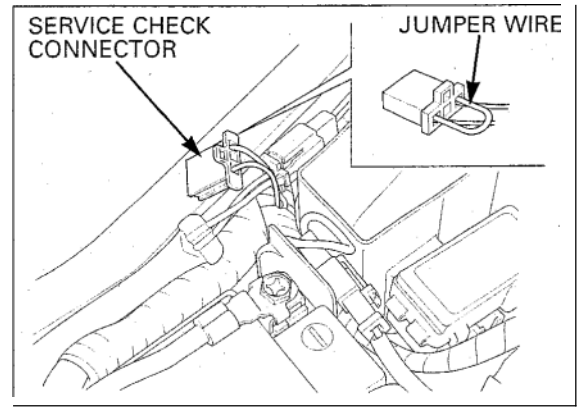
If you wish to read the PGM-FI memory for trouble data, perform the following:

Turn the ignition switch to "OFF".



Remove the seat (page 2-2).

Short the PGM-FI system service check connector terminals using a jumper wire.



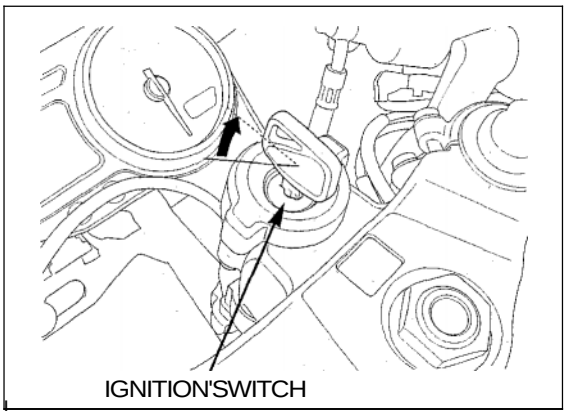
Turn the ignition switch to "ON" and engine stop switch to "RUN".

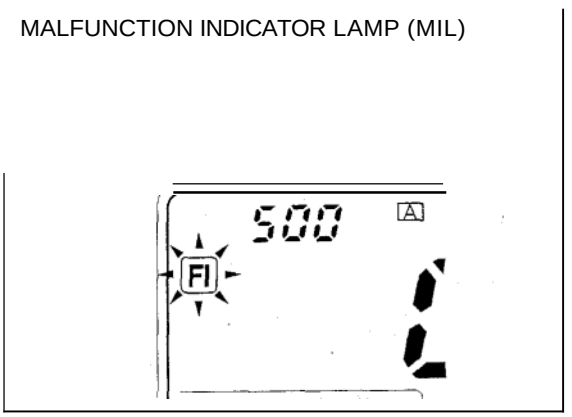
If the ECM has no self diagnosis memory data, the MIL will illuminate, when you turn the ignition switch to "ON".

If the ECM has self diagnosis memory data, the MIL will start blinking, when you turn the ignition switch to "ON".

Note how many times the malfunction indicator blinks, and determine the cause of the problem (page 5-10 through 5-53).

Even if the PGM-FI has memory data, the MIL does not blink when the engine running.



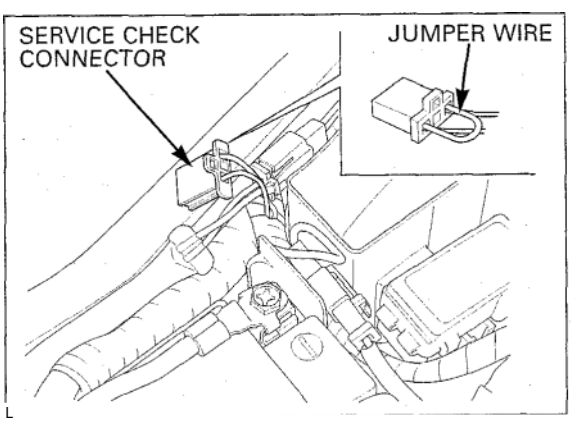


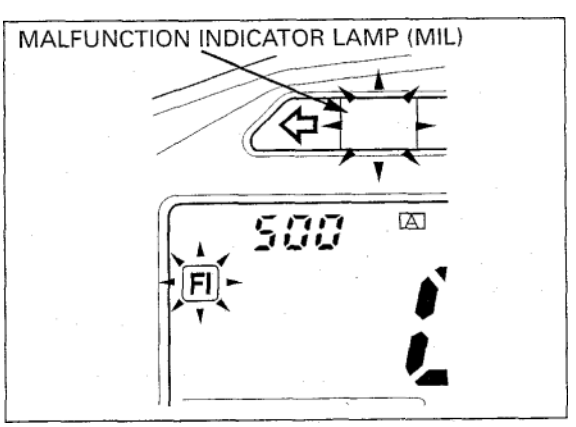
SELF-DIAGNOSIS RESET PROCEDURE

1. Turn the engine stop switch to "RUN" and ignition switch to "OFF".
2. Short the service check connector of the PGM-FI system using a jumper wire.
3. Turn the ignition switch to "ON".
4. Remove the jumper wire from the service check connector.
5. The MIL lights about 5 seconds. While the indicator lights, short the service check connector again with the jumper wire.
   Self diagnosis memory data is erased if the MIL turns off and starts blinking.

- The service check connector must be jumped while the indicator lights. If not, the MIL will not start blinking.
- Note that the self diagnosis memory data cannot be erased if you turn off the ignition switch before the MIL starts blinking.

If the MIL blinks 20 times, the data has not been erased, so try again.





PEAK VOLTAGE INSPECTION PROCEDURE

- Use this procedure for the ignition pulse generator and cam pulse generator inspection.
- Check all system connections before inspection. If the system is disconnected, incorrect peak voltage might be measured.
- Check cylinder compression and check that all the spark plugs are installed correctly.
- Use the recommended digital muitimeter or a commercially available digital multimeter with an impedance of 10 MΩ/DCV minimum.
- The display value differs depending upon the internal impedance of the multimeter.
- Disconnect the fuel pump connector before checking the peak voltage.

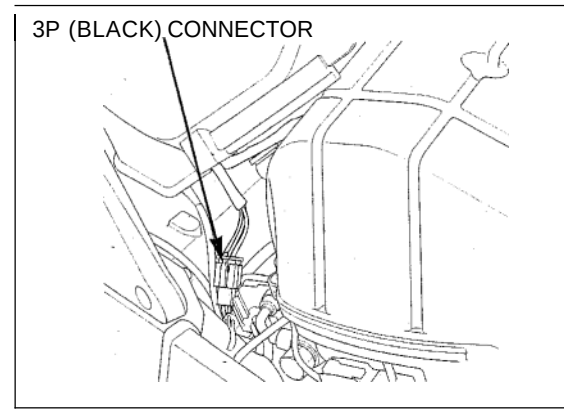
Open and support the front end of the fuel tank (page 3-4).

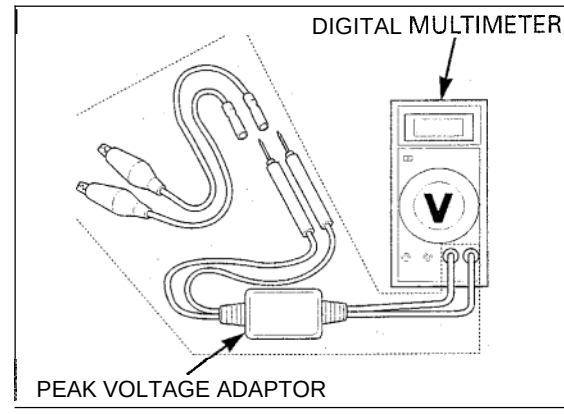
Disconnect the fuel pump 3P (Black) connector.

Avoid touching the tester probes to prevent electric shock

Connect the peak voltage adaptor to the digital multimeter.

TOOLS:
IgnitionMate peak voltage tester (U.S.A. only) or
Peak voltage adaptor 07HGJ-0020100 (not available in U.S.A.)
with commercially available digital multimeter (impedance 10 MΩ/DCV minimum)

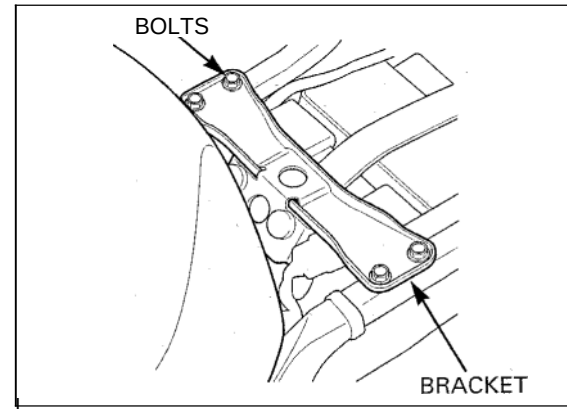




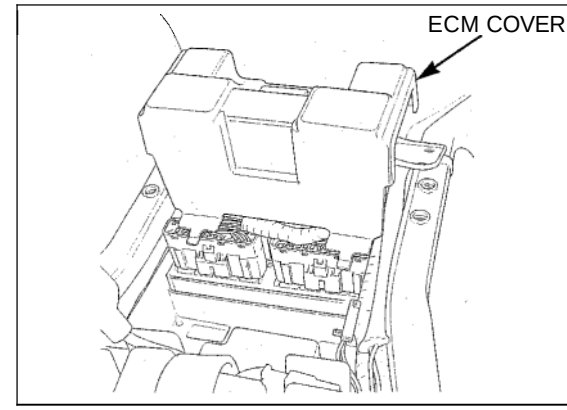
TEST HARNESS CONNECTION

Remove the seat (page 2-2).
Remove the battery (page 16-4).

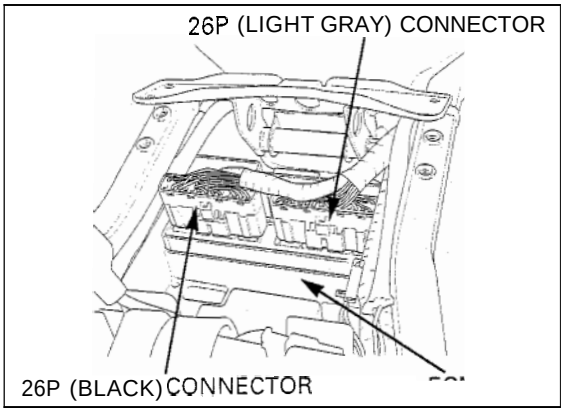
Remove the fuel tank rear bracket mounting bolts and pull up the bracket.



Remove the ECM cover.

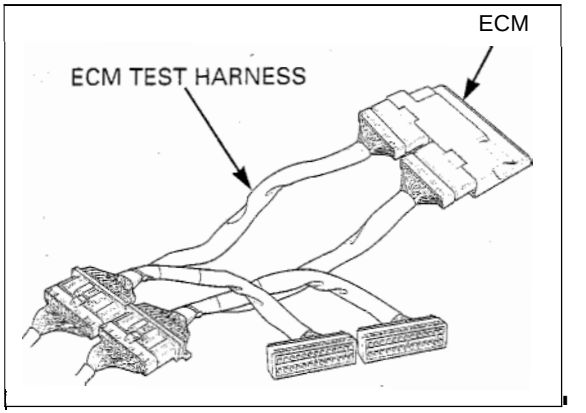


Disconnect the ECM 26P (Black) and 26P (Light gray) connectors from the unit.



Connect the ECM test harnesses between the main wire harness and the ECM.

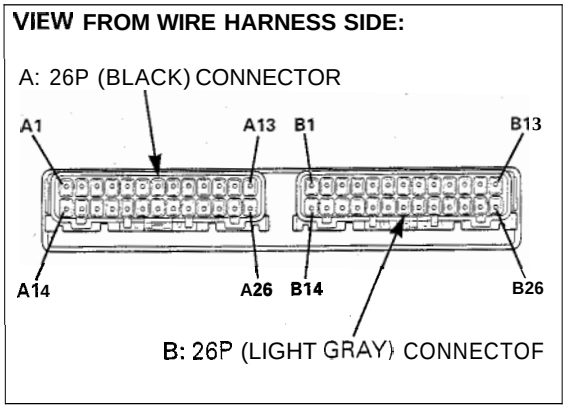
TOOL:
ECM test harness, 26P **070MZ–0010100**
(two required)



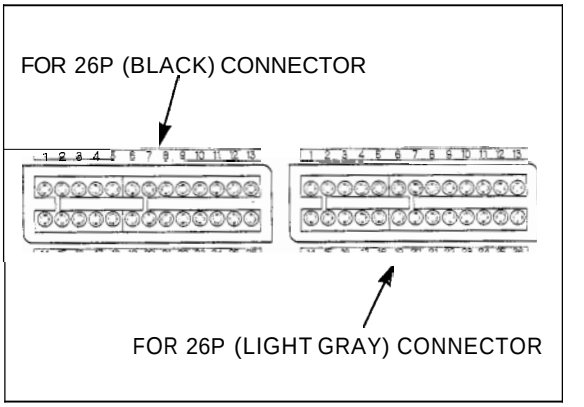
Install the battery and connect the positive terminal, then connect the negative terminal.

TEST HARNESS TERMINAL LAYOUT

The ECM connector terminals are numbered as shown in the illustration.



The test harness terminals are same layout as for the ECM connector terminals as shown.



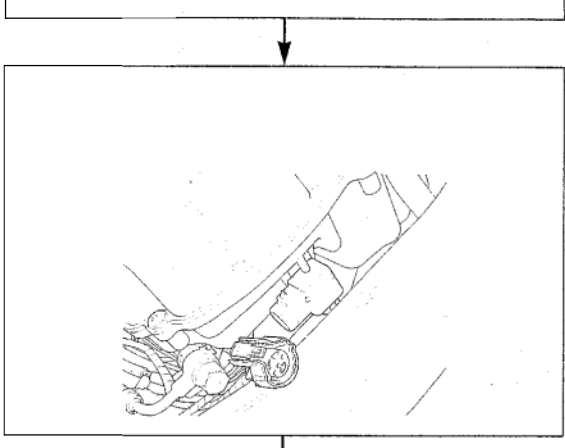
PGM-FI SELF-DIAGNOSIS MALFUNCTION INDICATOR LAMP (MIL) FAILURE CODES

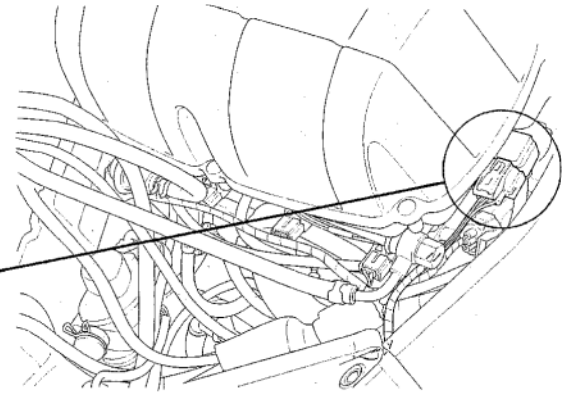
- The PGM-FI malfunction indicator lamp (MIL) denotes the failure codes (the number of blinks from 0 to 35). The MIL has two types of blinks, a long blink and short blink. The long blink lasts for 1.3 seconds, the short blink lasts for 0.5 seconds. When two long blinks occur, and one short blink, that problem code is 21 (two long blinks = 20 blinks, one short blink = 1 blink). Then, go to the flow chart and see problem code 21.
- When the Engine Control Module (ECM) stores some failure codes, the MIL shows the failure codes in the order from the lowest number to highest number. For example, when the MIL blinks once, then blinks seven times, two failures have occurred. Follow the flow chart for failure codes 1 and 7.

Number of PGM-FI MIL blinks		Causes	Symptoms (Fail-safe contents)	Refer to page
0	No blinks	• Open circuit at the power input wire of the ECM • Faulty bank angle sensor • Open circuit in bank angle sensor related circuit • Faulty engine stop relay • Open circuit in engine stop relay related wires • Faulty engine stop switch • Open circuit in engine stop switch related wires • Faulty ignition switch • Faulty ECM • Blown PGM-FI fuse (20 A) • Open circuit in engine stop switch ground • Blown sub-fuse (10 A) (Starter/ignition)	• Engine does not start	—
	No blinks	• Open or short circuit in malfunction indica wire • Faulty ECM	• Engine operates normally	—
	Stays lit	• Short circuit in service check connector • Faulty ECM • Short circuit in service check connector wi	• Engine operates normally	
1	Blinks	• Loose or poor contacts on MAP sensor connector • Open or short circuit in MAP sensor wire • Faulty MAP sensor • Wrong connection between the MAP sens and TP sensor connectors	• Engine operates normally	5-12
2	Blinks	• Loose or poor connection of the MAP sen: vacuum hose • Faulty MAP sensor	• Engine operates normally	5-14
7	Blinks	• Loose or poor contact on ECT sensor • Open or short circuit in ECT sensor wire • Faulty ECT sensor	• Hard start at a low temperature (Simulate using numerical values: 90°C/194°F)	5-16
8	Blinks	• Loose or poor contact on TP sensor connector • Open or short circuit in TP sensor wire • Faulty TP sensor	• Poor engine response when operating the throttle quickly (Simulate using numerical values: Throttle opens 0°)	5-18
9	Blinks	• Loose or poor contact on IAT sensor • Open or short circuit in IAT sensor wire • Faulty IAT sensor	• Engine operates normally (Simulate using numerical values; 25°C/77°F)	5-22

Number of PGM-FI MIL blinks	Causes	Symptoms (Fail-safe contents)	Refer to page
11 Blinks	• Loose or poor contact on vehicle speed sensor connector • Open or short circuit in vehicle speed sensor connector • Faulty vehicle speed sensor	• Engine operates normally	5-24
Blinks	• Loose or poor contact on No.1 injector connector • Open or short circuit in No.1 injector wire • Faulty No.1 injector	• Engine does not start	5-26
13 Blinks	• Loose or poor contact on No.2 injector connector • Open or short circuit in No.2 injector wire • Faulty No.2 injector	• Engine does not start	**5-29**
14 Blinks	• Loose or poor contact on No.3 injector connector • Open or short circuit in No.3 injector wire • Faulty No.3 injector	• Engine does not start	5-32
15 Blinks	• Loose or poor contact on No.4 injector connector • Open or short circuit in No.4 injector wire • Faulty No.4 injector	• Engine does not start	
18 Blinks	• Loose or poor contact on cam pulse generator • Open or short circuit in cam pulse generator • Faulty cam pulse generator	• Engine does not start	5-38
19 Blinks	• Loose or poor contact on ignition pulse generator connector • Open or short circuit in ignition pulse generator • Faulty ignition pulse generator	• Engine does not start	5-40
21 Blinks	• Faulty O_2 sensor	• Engine operates normally	5-42
23 Blinks	• Faulty O_2 sensor heater	• Engine operates normally	5-44
33 Blinks	• Faulty E^2-PROM in ECM	• Engine operates normally • Does not hold the self-diagnosis data	5-48
34 Blinks	• Faulty EGCV and air intake valve servo motor voltage	• Engine operates normally	5-50
35 Blinks	• Faulty EGCV and air intake valve servo motor	• Engine operates normally	5-52

PGM-FI MIL 1 BLINK (MAP SENSOR)





Connect the MAP sensor connector.
Place the motorcycle on its side stand.
Start the engine and check that the MIL blinks.

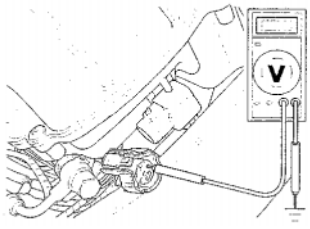
Does not blink → • Loose or poor contact on the MAP sensor connector

1 blink

Turn the ignition switch to "OFF".

Disconnect the MAP sensor 3P connector.
Turn the ignition switch to **"ON"**.
Measure the voltage at the wire harness side connector.

Out of range → • Open or short circuit in Yellow/Red wire
• Loose or poor contact on the ECM connectors

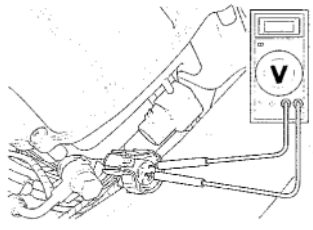


Connection: Yellow/Red (+) – Ground (–)
Standard: 4.75 – 5.25 V

Voltage exists

Measure the voltage between the connector terminals of the wire harness side.

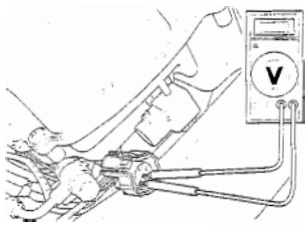
Out of range → • Open or short circuit in Green/Orange wire
• Loose or poor contact on the ECM connectors



Connection: Yellow/Red (+) – Green/Orange (–)
Standard: 4.75 – 5.25 V

Voltage exists

Measure the voltage between the terminals of the wire harness side.



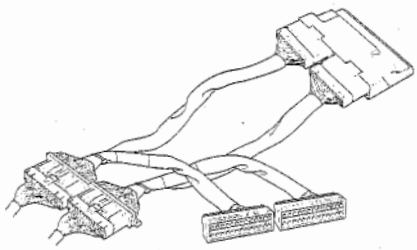
Connection:
Light green/Yellow (+) – Green/Orange (–)
Standard: 4.75 – 5.25 V

Out of range →
- Open or short circuit in Light green/Yellow wire
- Loose or poor contact on the ECM connectors

Voltage exists ↓

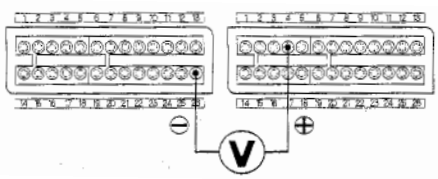
Turn the ignition switch to "OFF".
Connect the MAP sensor 3P connector.

Disconnect the ECM connectors.
Connect the test harness to ECM connectors.
Turn the ignition switch to "ON".



Measure the voltage at the test harness terminals (page 5-9).

→
- Faulty MAP sensor



Connection: B4 (+) – A26 (–)
Standard: 2.7 – 3.1 V (760 mm Hg/1,013 kPa)

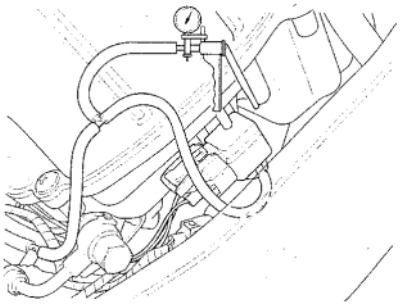
Voltage exists →
- Replace the ECM with a new one, and inspect it again

PGM-FI MIL 2 BLINKS (MAP SENSOR)

Turn the ignition switch to "OFF".

↓

Disconnect the vacuum hose from the MAP sensor.
Connect the vacuum gauge between the throttle body and the MAP sensor using a 3-way joint.
Start the engine and measure the manifold absolute pressure at idle speed.

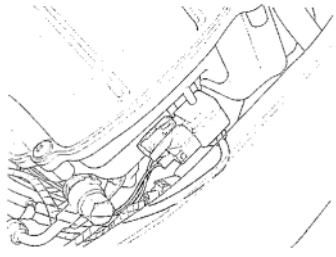


Standard: 150 – 250 mm Hg

Out of range → • Check the hose installation

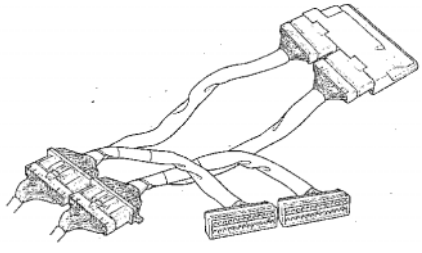
↓

Disconnect the vacuum gauge and connect the hose to the MAP sensor.

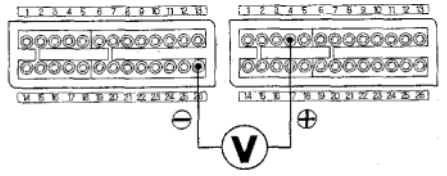


↓

Disconnect the ECM connectors.
Connect the test harness to the ECM connector.



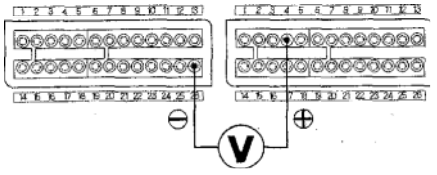
Turn the ignition switch *to* **"ON".**
Measure the voltage at the test harness terminals (page 5-9).



Out of range → ▪ Faulty MAP sensor

Voltage exists

Measure the voltage at the test harness terminals (page 5-9).



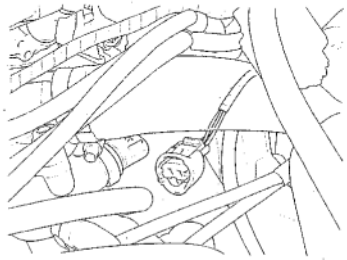
Connection: B4 (+) − A26 (–)
Standard: 2.7 V maximum

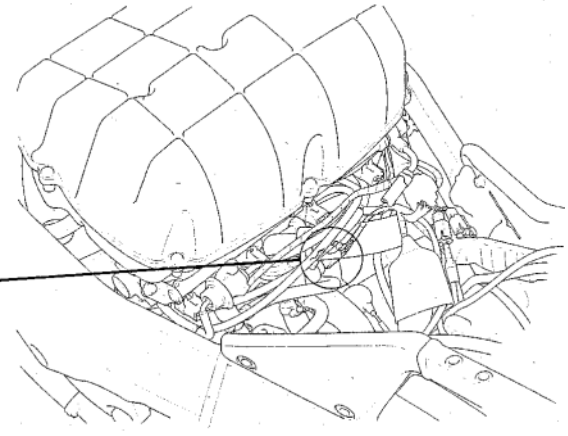
Voltage exists → ▪ Replace the ECM with a new one, and inspect it again

PGM-FI MIL 7 BLINKS (ECT SENSOR)

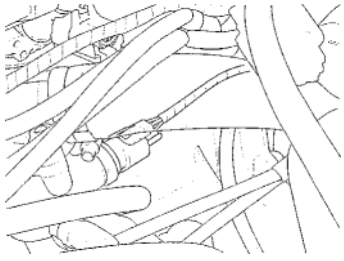
Turn the ignition switch to "OFF".

Disconnect the ECT sensor 3P connector.
Check for loose or poor contact on the ECT sensor connector.





Connect the ECT sensor connector.
Place the motorcycle on its side stand.
Turn the ignition switch to **"ON"**.

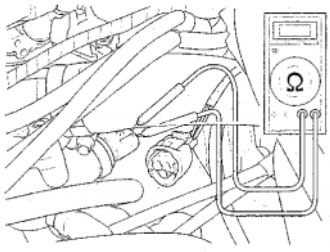


Check that the MIL blinks.

Does not blink → • Loose or poor contact on the ECT sensor connector

7 blinks

Turn the ignition switch to "OFF".
Disconnect the ECT sensor connector.
Measure the resistance at the ECT sensor terminals.

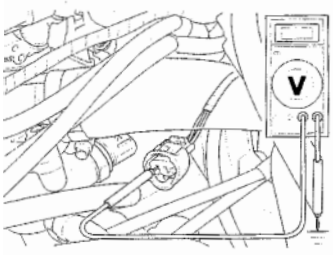


Connection: Pink/White (+) – Green/Orange (–) (sensor side terminals)
Standard: 2.3 – 2.6 kΩ (20°C/68°F)

Abnormal → • Faulty ECT sensor

Normal

Turn the ignition switch to "ON".
Measure the voltage between the ECT sensor connector terminal of the wire harness side and ground.

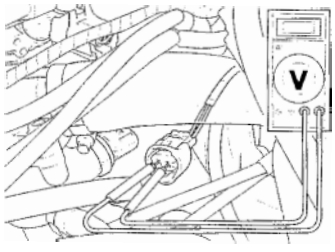


Connection: **Pink/White** (+) – Ground (–)
Standard: ***4.75 – 5.25*** **V**

Out of range →
- Open or short circuit in Pink and Pink/White wire
- Loose or poor contacts on the ECM connector

Voltage exists

Measure the voltage at the ECT sensor connector of the wire harness side.



Connection: **Pink/White** (+) – **Green/Orange** (–)
Standard: ***4.75 – 5.25*** **V**

Out of range →
- Open or short circuit in Green/Orange wire
- Loose or poor contacts on the ECM connector

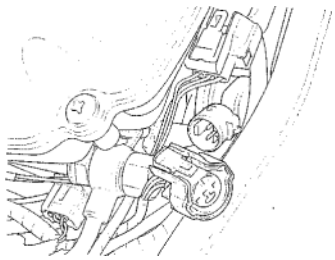
Voltage exists →
- Replace the ECM with a new one, and inspect it again

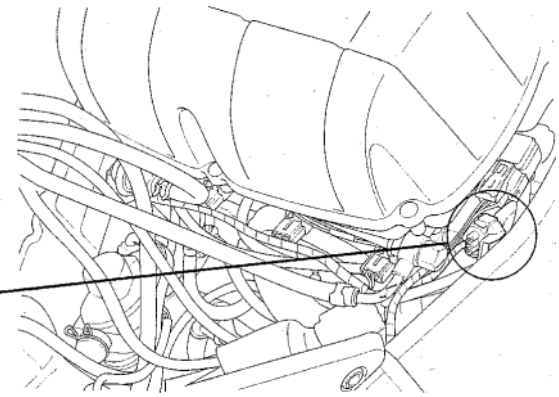
PGM-FI MIL 8 BLINKS (TP SENSOR)

Turn the ignition switch to "OFF".

↓

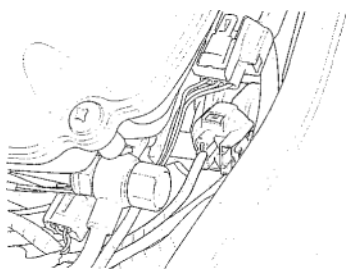
Disconnect the TP sensor 3P connector.
Check for loose or poor contact on the TP sensor connector.





nector.

Place the motorcycle on its side stand.
Start the engine and check that the MIL blinks.

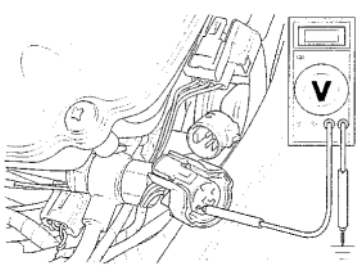


↓ 8 blinks

Turn the ignition switch to "OFF".

↓

Disconnect the TP sensor 3P connector.
Turn the ignition switch to **"ON"**.
Measure the voltage between the wire harness side connector terminal and ground.

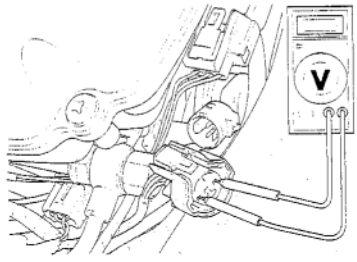


Connection: Yellow/Red (+) − Ground (–)
Standard: 4.75 − 5.25 V

Out of range →
- Open or short circuit in the Yellow/Red wire
- Loose or poor contact on the ECM connector

↓ Voltage exists

Measure the voltage at the TP sensor terminals of the wire harness side.

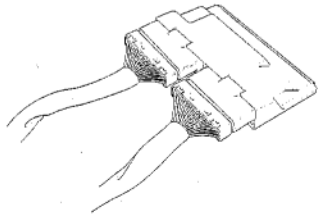


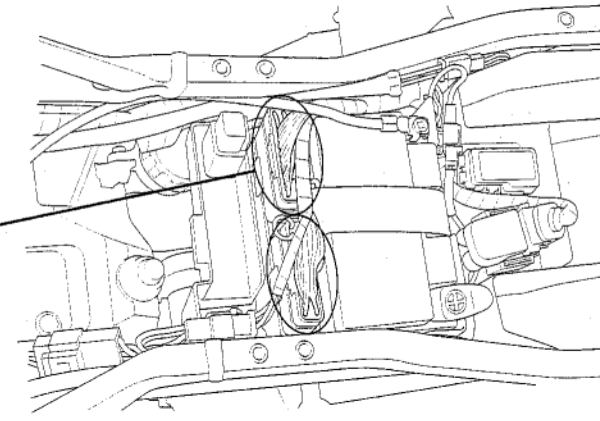
Connection: Yellow/Red (+) – Green/Orange (–)
Standard: 4.75 – 5.25 V

Out of range →
- Open or short circuit in Green/Orange wire
- Loose or poor contact on the ECM connectors

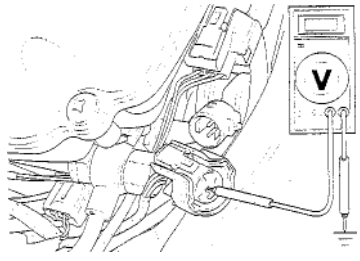
Voltage exists ↓

Turn the ignition switch to "OFF".
Disconnect the ECM **26P** connectors.





Check for continuity between the TP sensor connector terminal of the wire harness side and ground.

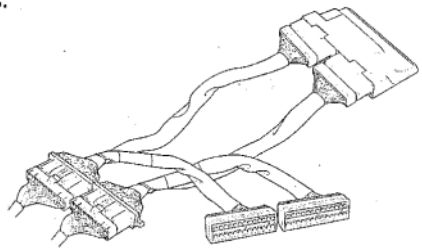


Connection: Red/Yellow (+) – Ground (–)
Standard: No continuity

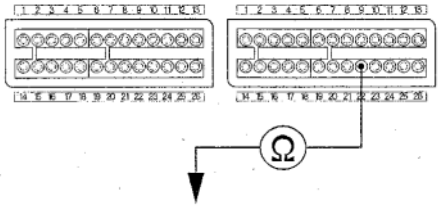
Continuity →
- Short circuit in Red/Yellow wire

No continuity ↓

Connect the test harness to the ECM connectors.



Check for continuity between the test harness terminal and the TP sensor connector terminal.

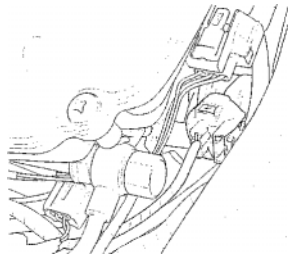


Connection: Red/Yellow − B22
Standard: Continuity

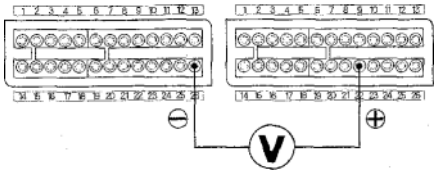
- Open or short circuit in Red/Yellow wire

Continuity

Connect the TP sensor **3P** connector.



Turn the ignition switch to "ON".
Measure the voltage at the test harness terminals.



Connection: B22 (+) **– A26** (–)
Standard: *0.4 – 0.6 V (throttle fully closed)
***4.2 – 4.8 V (throttle fully open)**

Normal → • Replace the ECM with a new one, and inspect it again

A voltage marked * refers to the value when the voltage reading at the TP sensor 3P connector (page 5-19) shows 5 V. When the reading shows other than 5 V, derive a voltage at the test harness as follows:

In the case of a voltage of 4.75 V at the TP sensor 3P connector:

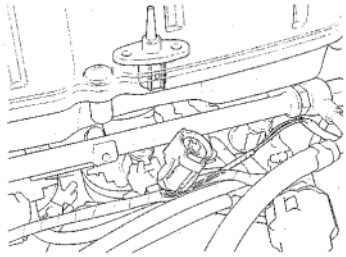
0.4 X 4.75/5.0 = 0.38 V
0.6 X 4.75/5.0 = 0.57 V

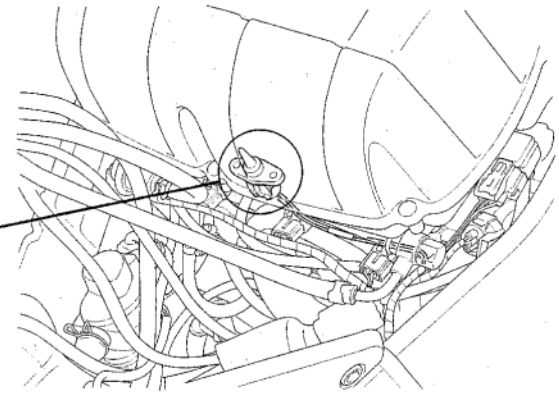
Thus, the solution is "0.38 – 0.57 V" with the throttle fully closed.
Replace 0.4 and 0.6 with 4.2 and 4.8 respectively, in the above equations to determine the throttle fully open range.

PGM-FI MIL 9 BLINKS (IAT SENSOR)

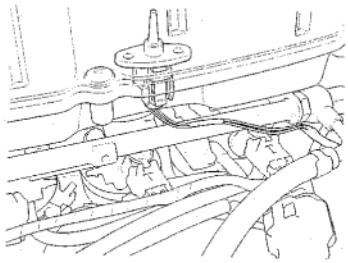
Turn the ignition switch to "OFF"

Disconnect the IAT sensor 2P connector.
Check for loose or poor contact on the IAT sensor connector.





Connect the IAT sensor 2P connector.
Place the motorcycle on its side stand.
Turn the ignition switch to "ON".
Check that the MIL blinks.

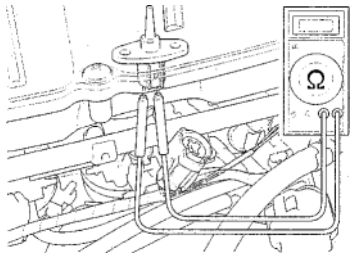


Does not blink → • Loose or poor contact on the IAT sensor connector

9 blinks

Turn the ignition switch to "OFF".

Disconnect the IAT sensor 2P connector.
Measure the resistance at the IAT sensor (at 20 – 30 °C/68 – 86 °F).



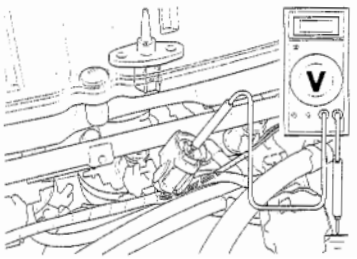
Standard: 1 – 4 kΩ

Abnormal → • Faulty IAT sensor

Normal

Turn the ignition switch to "ON".

Measure the voltage between the terminals of the wire harness side.

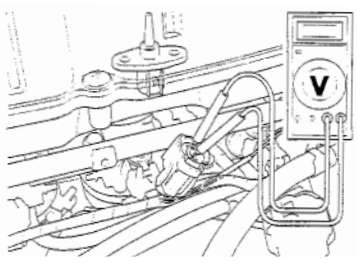


Connection:
Gray/Blue (+) – **Ground** (–)
Standard: 4.75 – 5.25 V

Out of range → • Open or short circuit in Gray/Blue wire
• Loose or poor contact on the ECM connectors

Voltage exists

Measure the voltage between the terminals of the wire harness side.



Connection:
Gray/Blue (+) – Green/Orange (–)
Standard: 4.75 – 5.25 V

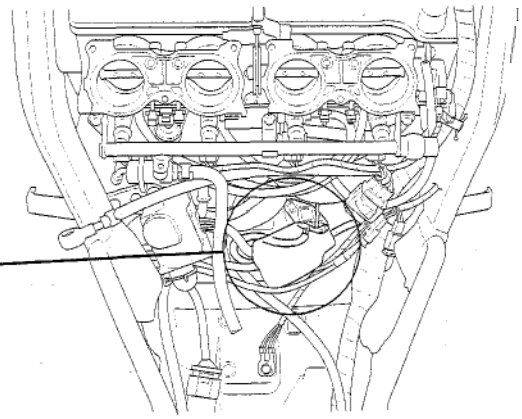
Out of range → • Open or short circuit in Green/Orange wire
• Loose or poor contact on the ECM connectors

Voltage exists → • Replace the ECM with a new one, and inspect it again

PGM-FI MIL 11 BLINKS (VEHICLE SPEED SENSOR)

Turn the ignition switch to "OFF".

Disconnect the vehicle speed sensor 3P connector.
Check for loose or poor contact on the vehicle speed sensor connector.



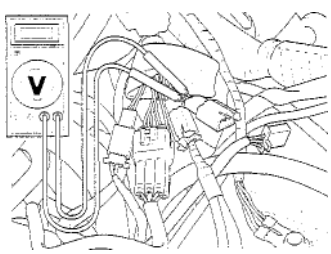
Connect the vehicle speed sensor 3P connector.
Start the engine.
With the side stand UP and keep the engine rev more than 5,000 rpm about 20 seconds or more.
Check that the MIL blinks.

Does not blink → • Loose or poor contact on the vehicle speed sensor connector

11 blinks

Turn the ignition switch to "OFF"

Disconnect the vehicle speed sensor 3P connector.
Turn the ignition switch to "ON".
Measure the voltage at the wire harness side connector.

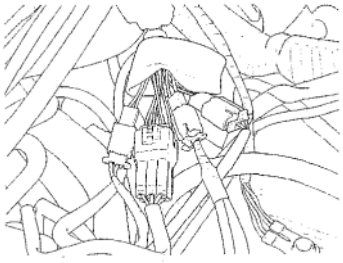


Connection: Black/Brown (+) – Green/Black (–)
Standard: 12 V

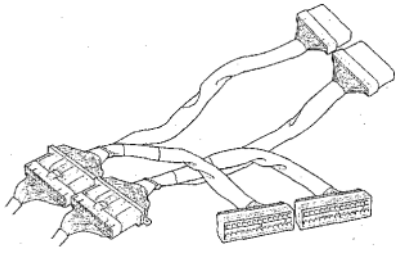
Out of range → • Open or short circuit in Black/Brown wire

Voltage exists

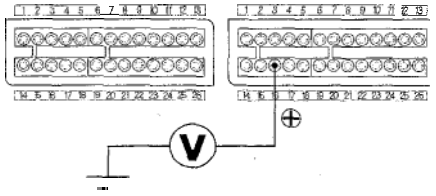
Connect the vehicle speed sensor **3P** connector.



Disconnect the ECM connectors.
Connect the test harness to the wire harness connectors.



Support the motorcycle securely and place the rear wheel off the ground.
Shift the transmission into gear.
Measure the voltage at the test harness terminals with the ignition switch turned to "ON" while slowly turning the rear wheel by hand.



CONNECTION: B16 (+) – Ground (–)
STANDARD: Repeat 0 to 5V

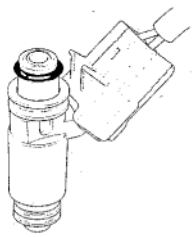
Abnormal → • Open or short circuit in Pink/Green wire

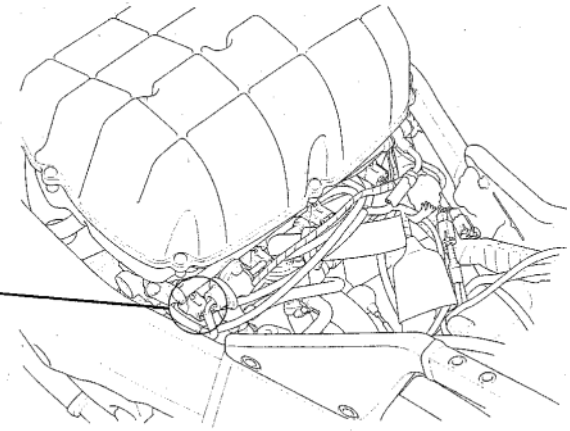
Normal →

PGM-FI MIL 12 BLINKS (No.1 INJECTOR)

Turn the ignition switch to "OFF".

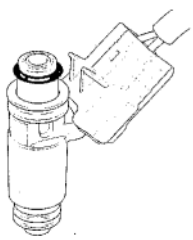
Disconnect the No.1 injector 2P connector.
Check for loose or poor contact on the No.1 injector 2P connector.





Connect the No.1 injector 2P connector.
Place the motorcycle on its side stand.
Turn the ignition switch to "ON".
Check that the MIL blinks.

- Loose or poor contact on the No.1 injector connector

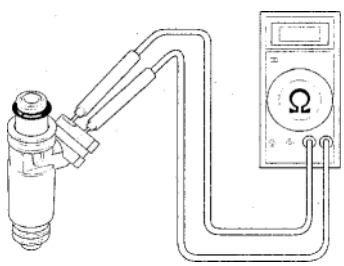


12 blinks

Turn the ignition switch to "OFF".
Disconnect the No.1 injector 2P connector and measure the resistance of the No.1 injector.

Abnormal

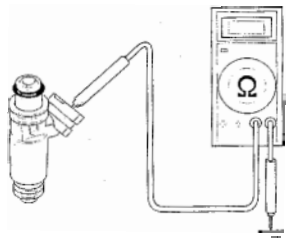
- Faulty No.1 injector



Connection:
Black/White (+) – Pink/Yellow (–)
Standard: 10.5 – 14.5 Ω (20°C/68°F)

Normal

Check for continuity between the No.1 injector and ground.

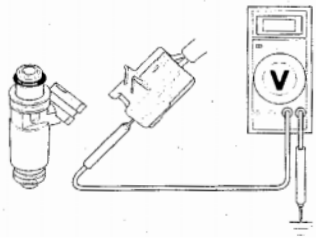


Connection:
Black/White (+) – **Ground (–)**
Standard: No continuity

Continuity → • Faulty No.1 injector

No continuity ↓

Turn the ignition switch to "ON".
Measure the voltage between the No.1 injector connector of the wire harness side and ground.

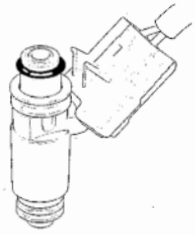


Connection:
Black/White (+) – **Ground (–)**
Standard: Battery voltage

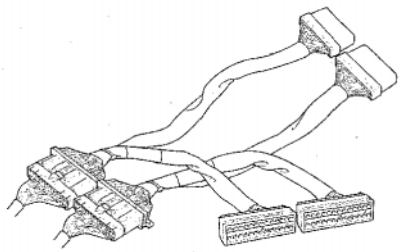
Out of range → Open or short circuit in Black/White wire

Voltage exists ↓

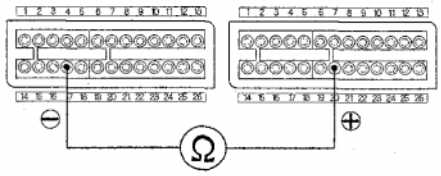
Turn the ignition switch to "OFF".
Connect the No.1 injector connector.



Disconnect the ECM connectors.
Connect the test harness to the wire harness connectors.



Measure the resistance at the test harness terminals.

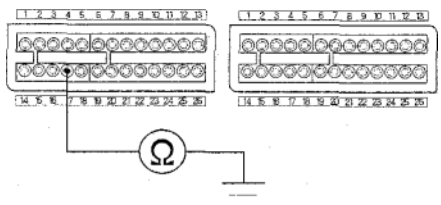


Connection: A17 (–) – B20 (+)
Standard: 9 – 15 Ω (20°C/68°F)

Out of range → • Open circuit in Black/White and/or Pink/Yellow wire

Normal

Check for continuity between the test harness terminal and ground.



Connection: A17 – Ground
Standard: No continuity

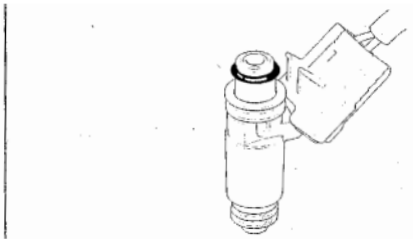
Continuity → • Short circuit in Pink/Yellow wire

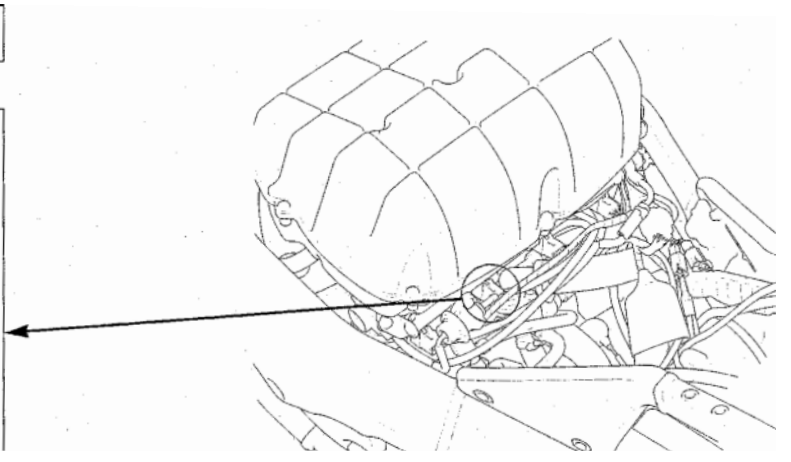
No continuity → • Replace the ECM with a new one, and inspect it again

PGM-FI MIL 13 BLINKS (No.2 INJECTOR)

Turn the ignition switch to "OFF".

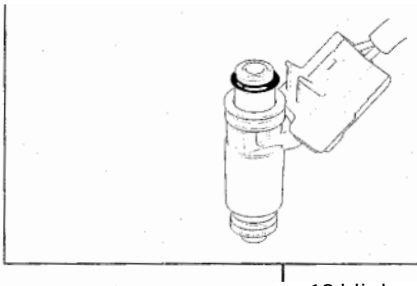
Disconnect the No.2 injector 2P connector.
Check for loose or poor contact on the No.2 injector 2P connector.





Connect the No.2 injector 2P connector.
Place the motorcycle on its side stand.
Turn the ignition switch to "ON".
Check that the MIL blinks.

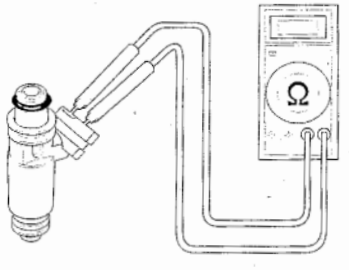
Does not blink → ▪ Loose or poor contact on the No.2 injector connector



13 blinks

Turn the ignition switch to "OFF".
Disconnect the No.2 injector 2P connector and measure the resistance of the No.2 injector.

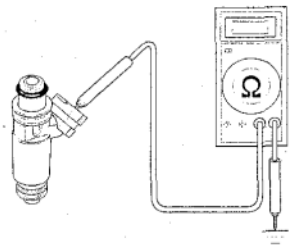
Abnormal → • Faulty No.2 injector



Connection:
Black/White (+) – Pink/Blue (–)
Standard: 10.5 – 14.5 Ω (20°C/68°F)

Normal

Check for continuity between the No.2 injector and ground.

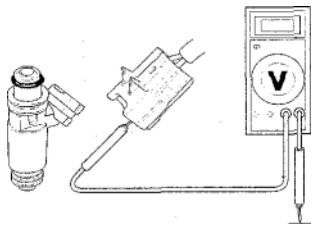


Connection:
Black/White (+) – Ground (–)
Standard: No continuity

Continuity → • Faulty No.2 injector

No continuity

Turn the ignition switch to "ON".
Measure the voltage between the No.2 injector connector of the wire harness side and ground.

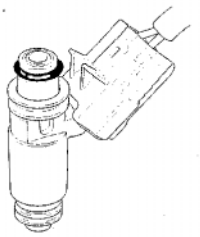


Connection:
Black/White (+) – Ground (–)
Standard: Battery voltage

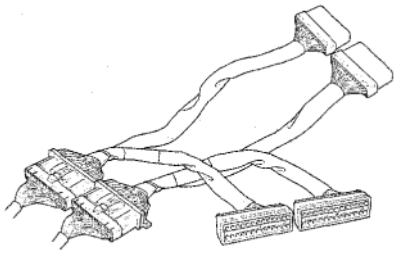
Out of range → • Open or short circuit in Black/White wire

Voltage exists

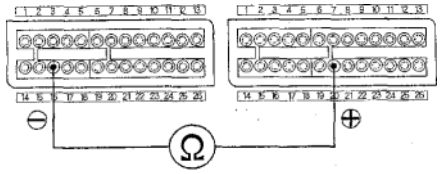
Turn the ignition switch to "OFF".
Connect the No.2 injector connector.



Disconnect the ECM connectors.
Connect the test harness to the wire harness connectors.



Measure the resistance at the test harness terminals.

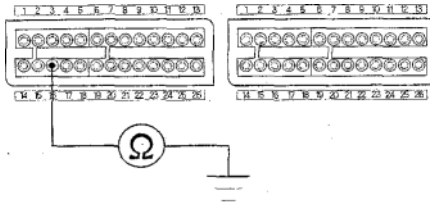


Connection: A16 (–) – B20 (+)
Standard: 9 – 15 Ω (20°C/68°F)

Out of range → • Open circuit in Black/White and/or Pink/Blue wire

Normal

Check for continuity between the test harness terminal and ground.



Connection: A16 – Ground
Standard: No continuity

Continuity → • Short circuit in Pink/Blue wire

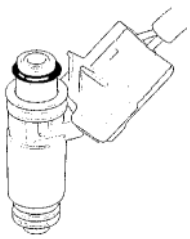
No continuity

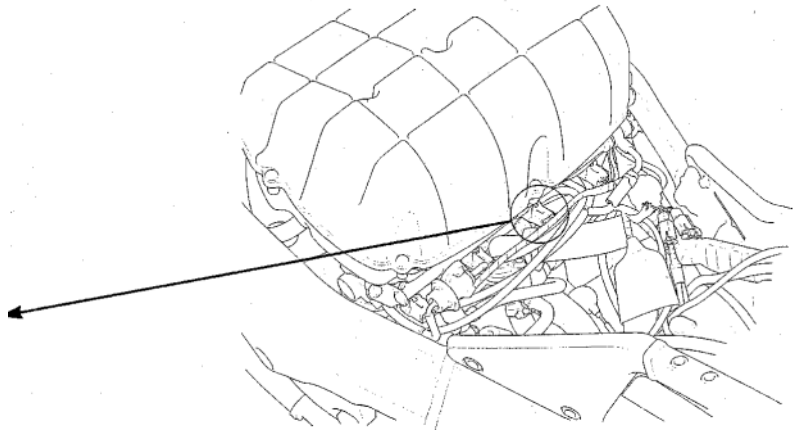
PGM-FI MIL 14 BLINKS (No.3 INJECTOR)

Turn the ignition switch to "OFF".

↓

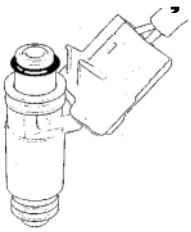
Disconnect the No.3 injector 2P connector.
Check for loose or poor contact on the No.3 injector 2P connector.





tor

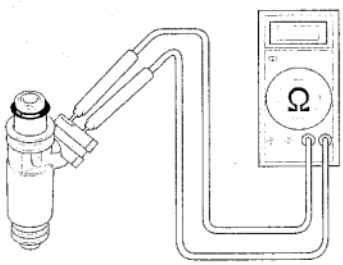
Place the motorcycle on its side stand.
Turn the ignition switch to "ON".
Check that the MIL blinks.



↓ 14 blinks

Turn the ignition switch to "OFF".
Disconnect the No.3 injector 2P connector and measure the resistance of the No.3 injector.

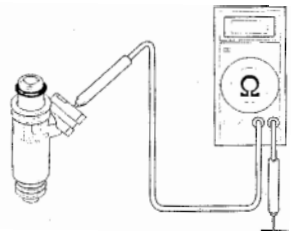
Abnormal → • Faulty No.3 injector



Connection:
Black/White (+) – Pink/Green (–)
Standard: 10.5 – 14.5 Ω (20°C/68°F)

Normal

Check for continuity between the No.3 injector and ground.

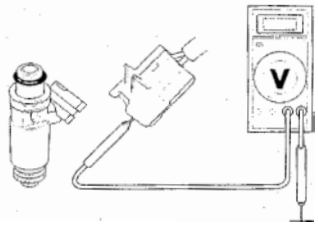


Connection:
Black/White (+) – Ground (–)
Standard: No continuity

Continuity → • Faulty No.3 injector

No continuity

Turn the ignition switch to "ON".
Measure the voltage between the No.3 injector connector of the wire harness side and ground.

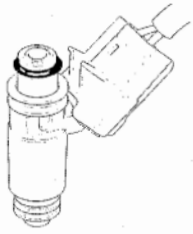


Connection:
Black/White (+) – Ground (–)
Standard: Battery voltage

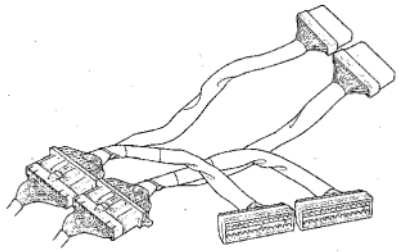
Out of range → • Open or short circuit in Black/White wire

Voltage exists

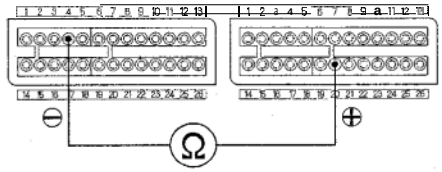
Turn the ignition switch to "ON".
Connect the No.3 injector connector.



Disconnect the ECM connectors.
Connect the test harness to the wire harness connectors.



Measure the resistance at the test harness terminals.

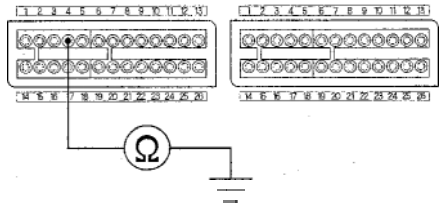


Connection: A4 (–) – B20 (+)
Standard: 9 – 15 Ω (20°C/68°F)

Out of range → • Open circuit in Black/White and/or Pink/Green wire

Normal

Check for continuity between the test harness terminal and ground.



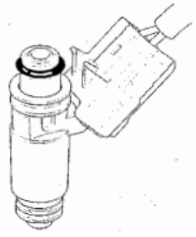
Connection: A4 – Ground
Standard: No continuity

Continuity → • Short circuit in Pink/Green wire

PGM-FI MIL 15 BLINKS (No.4 INJECTOR)

Turn the ignition switch to "OFF".

Disconnect the No.4 injector 2P connector.
Check for loose or poor contact on the No.4 injector 2P connector.



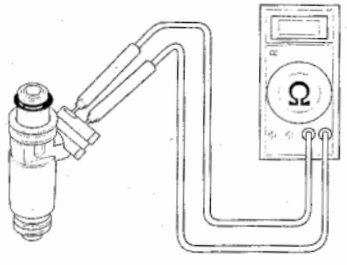
Connect the No.4 injector 2P connector.
Place the motorcycle on its side stand.
Turn the ignition switch to "ON".
Check that the MIL blinks.

Does not blink → • Loose or poor contact on the No.4 injector connector

15 blinks

Turn the ignition switch to "OFF".
Disconnect the No.4 injector 2P connector and measure the resistance of the No.4 injector.

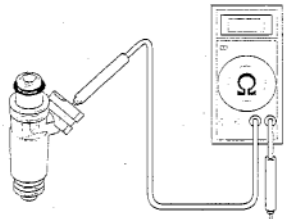
Abnormal → • Faulty No.4 injector



Connection:
Black/White (+) – Pink/Black (–)
Standard: 10.5 – 14.5 Ω (20°C/68°F)

Normal

Check for continuity between the No.4 injector and ground.

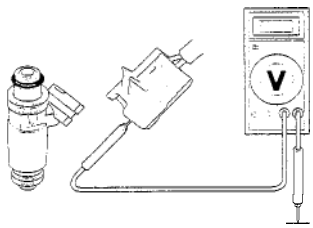


Connection:
Black/White (+) – Ground (–)
Standard: No continuity

Continuity → • Faulty No.4 injector

No continuity ↓

Turn the ignition switch to "ON".
Measure the voltage between the No.4 injector connector of the wire harness side and ground.

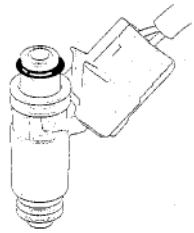


Connection:
Black/White (+) – Ground (–)
Standard: Battery voltage

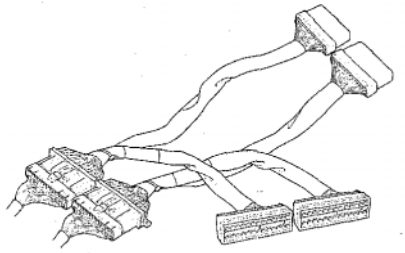
Out of range → • Open or short circuit in Black/White wire

Voltage exists ↓

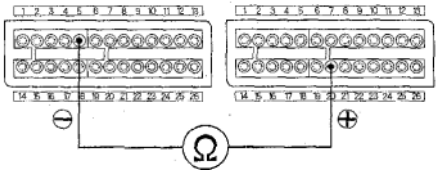
Turn the ignition switch to "OFF".
Connect the No.4 injector connector.



Disconnect the ECM connectors.
Connect the test harness to the wire harness connectors.



Measure the resistance at the test harness terminals.

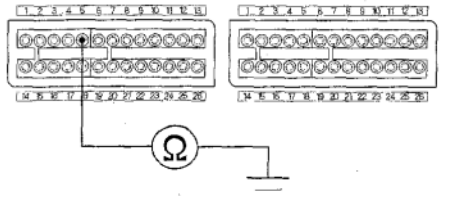


Connection: A5 (–) – B20 (+)
Standard: 9 – 15 Ω (20°C/68°F)

Out of range → • Open circuit in Black/White and/or Pink/Black wire

Normal ↓

Check for continuity between the test harness terminal and ground.



Connection: A5 – Ground
Standard: No continuity

Continuity → • Short circuit in Pink/Black wire

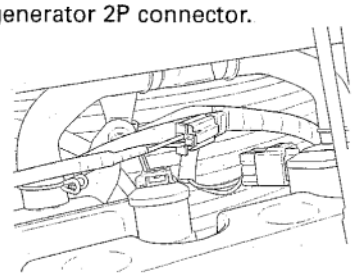
No continuity → • Replace the ECM with a new one, and inspect it again

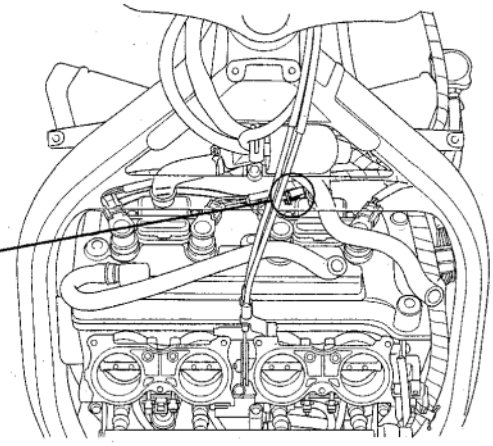
PGM-FI MIL 18 BLINKS (CAM PULSE GENERATOR)

Turn the ignition switch to "OFF".

↓

Disconnect the cam pulse generator 2P connector.
Check for loose or poor contact on the cam pulse generator 2P connector.





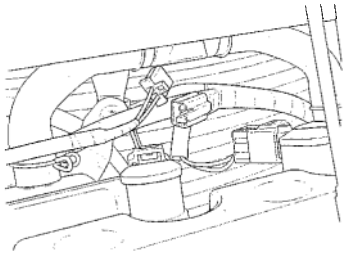
↓

Connect the cam pulse generator 2P connector.
Place the motorcycle on its side stand.
Turn the ignition switch to "ON" and check that the MIL blinks.

Does not blink → • Loose or poor contact on the cam pulse generator 2P connector

↓ 18 blinks

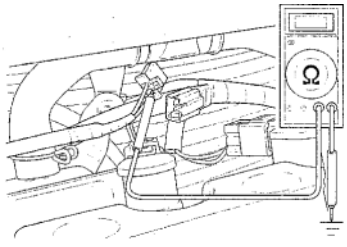
Turn the ignition switch to "OFF" and the engine stop switch to "OFF".
Disconnect the cam pulse generator 2P connector.



↓

Turn the ignition switch to "OFF".
Check the continuity between the cam pulse generator connector terminal and ground.

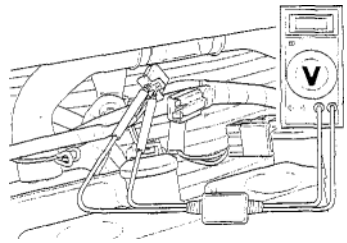
Continuity → • Faulty cam pulse generator



Connection: Gray – Ground
Black – Ground
Standard: No continuity

↓ No continuity

Crank the engine with the starter motor, and measure the cam pulse generator peak voltage at the cam pulse generator **2P** connector.

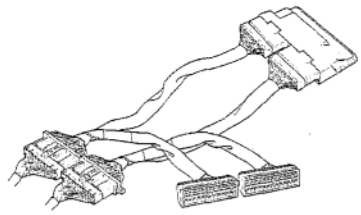


Connection: Gray (+) – Black (–)
Standard: 0.7 V minimum (20°C/68°F)

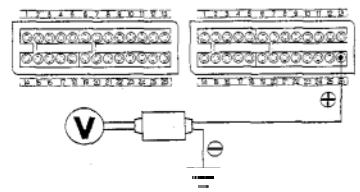
Out of range → • Faulty cam pulse generator

Normal

Connect the cam pulse generator 2P connector.
Disconnect the ECM connectors.
Connect the test harness to ECM connectors.



Crank the engine with the starter motor, and measure the cam pulse generator peak voltage at the test harness terminals.

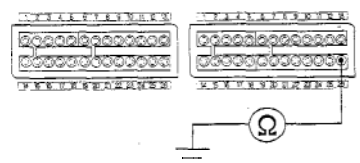


Connection: B26 (+) – Ground (–)
Standard: 0.7 V minimum (20°C/68°F)

Out of range → • Open circuit in White/Yellow and/or Gray wire

Normal

Check for continuity between the test harness terminal and ground.



Connection: B26 – Ground
Standard: No continuity

→ • Short circuit in Gray wire

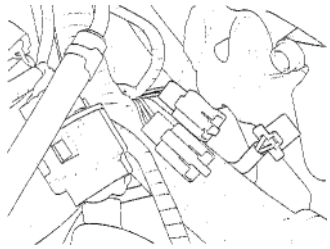
No continuity → • Replace the ECM with a new one, and inspect it again.

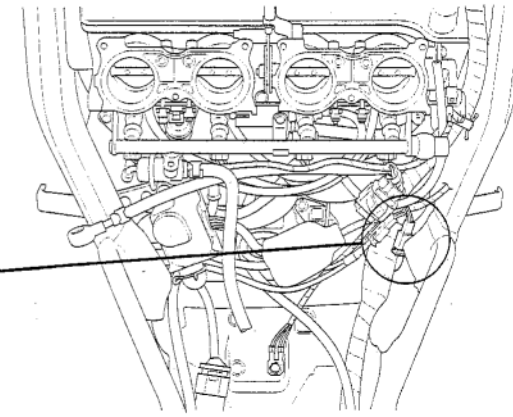
PGM-FI MIL 19 BLINKS (IGNITION PULSE GENERATOR)

Turn the ignition switch to "OFF".

↓

Disconnect the ignition pulse generator 2P connector.
Check for loose or poor contact on the ignition pulse generator 2P connector.





↓

Connect the ignition pulse generator 2P connector.
Place the motorcycle on its side stand.
Turn the ignition switch to "ON" and check that the MIL blinks.

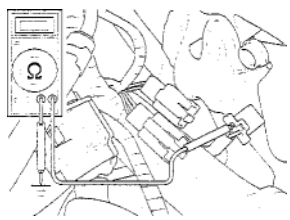
Does not blink → • Loose or poor contact on the ignition pulse generator 2P connector

↓ 19 blinks

Turn the ignition switch to "OFF" and the engine stop switch to "OFF".
Disconnect the ignition pulse generator 2P connector.

↓

Turn the ignition switch to "OFF".
Check the continuity between the ignition pulse generator connector terminal and ground.

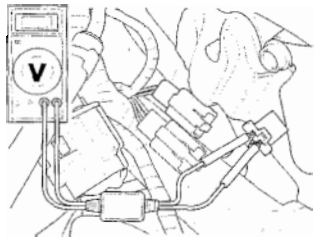


Connection: Yellow − Ground
White/Yellow − Ground
Standard: No continuity

Abnormal → • Faulty ignition pulse generator

↓ No continuity

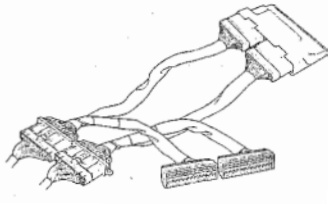
Crank the engine with the starter motor, and measure the ignition pulse generator peak voltage at the ignition pulse generator 2P connec-



Connection: Yellow (+) – **White/Yellow** (–)
Standard: 0.7 V minimum (20°C/68°F)

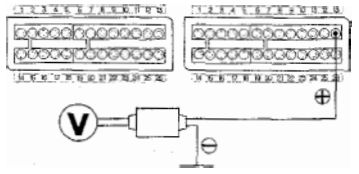
Normal ↓

Connect the ignition pulse generator 2P connector.
Disconnect the ECM connectors.
Connect the test harness to ECM connectors.



Crank the engine with the starter motor, and measure the ignition pulse generator peak voltage at the test harness terminals.

→
- Open circuit in White/Yellow wire
- Open circuit in Yellow wire

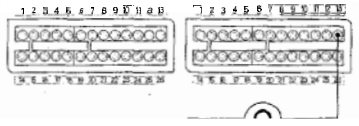


Connection: B13 (+) – **Ground** (–)
Standard: 0.7 V minimum (20°C/68°F)

Normal ↓

Check for continuity between the test harness terminal and ground.

Continuity →
- Short circuit in Yellow wire



Connection: B13 – Ground
Standard: No continuity

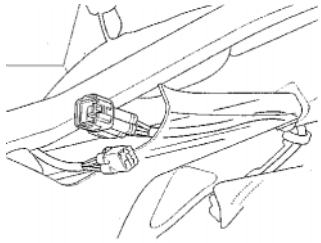
No continuity →
- Replace the ECM with a new one, and inspect it again

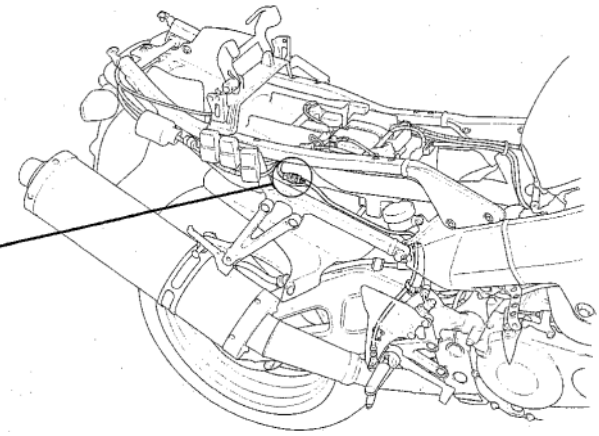
PGM-FI MIL 21 BLINKS (O_2 SENSOR/CALIFORNIA TYPE ONLY)

Turn the ignition switch to "OFF".

↓

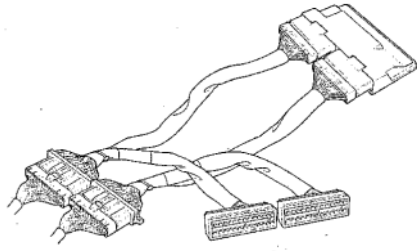
Disconnect the O_2 sensor connector.
Check for loose or poor contact on the O_2 sensor connector.





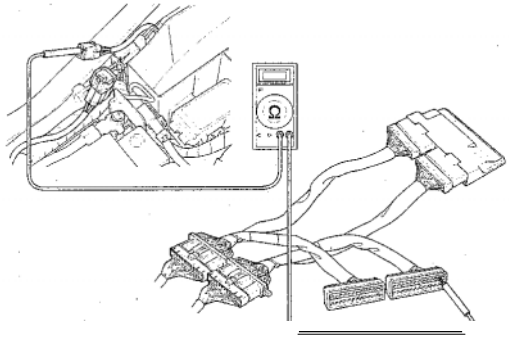
↓

Disconnect the ECM connectors..
Connect the test harness to ECM connectors.



↓

Check the continuity between the test harness terminal and O_2 sensor connector terminal.

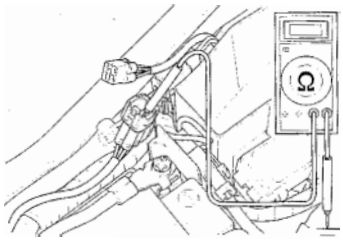


Connection: Orange/White – B12
Standard: Continuity

No continuity → • Open circuit in O_2 sensor Orange/White wire

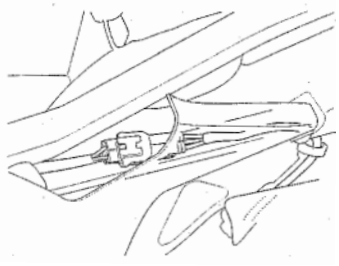
Continuity

Check the continuity between the O_2 sensor connector terminal and ground.



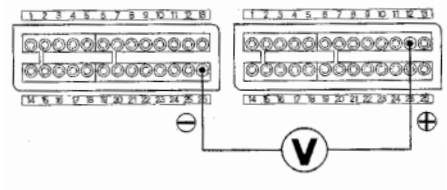
Continuity → • Short circuit in O_2 sensor Orange/White wire

Connect the O_2 sensor connector.
Turn the ignition switch to "ON" and warm up the engine until the coolant temperature is 80°C (176°F).



Operate the throttle grip and snap the engine speed from idle to 5,000 rpm.

Check the voltage between the test harness terminals.



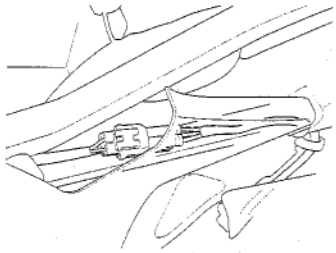
Out of range → • Faulty O_2 sensor

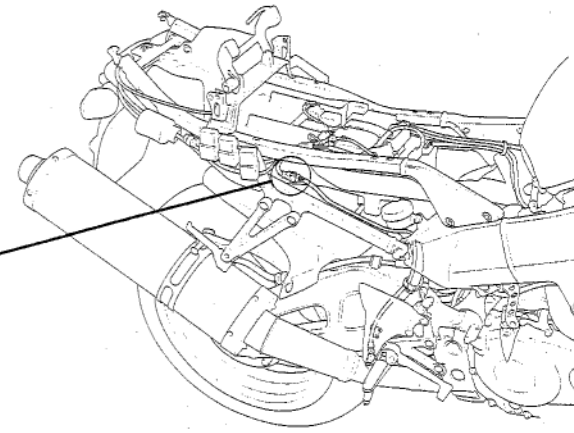
Connection: B1Z (+) – A26 (–)
Standard:
With the throttle fully open:
0.6 V minimum
With the throttle quickly closed:
0.4 V maximum

PGM-FI MIL 23 BLINKS (O_2 SENSOR HEATER/CALIFORNIA TYPE ONLY)

Turn the ignition switch to "OFF".

Disconnect the O_2 sensor connectors.
Check for loose or poor contact on the O_2 sensor connector.





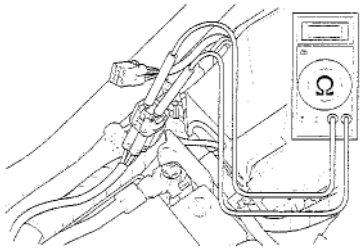
Connect the O_2 sensor connector.
Short the service check connector (page 5-6).
Start the engine and check that the MIL blinks.

Does not blink → • Loose or poor contact on the O_2 sensor connector

23 blinks

Turn the ignition switch to "OFF".

Disconnect the O_2 sensor 4P connector.
Measure the resistance at the sensor side connector White terminals.



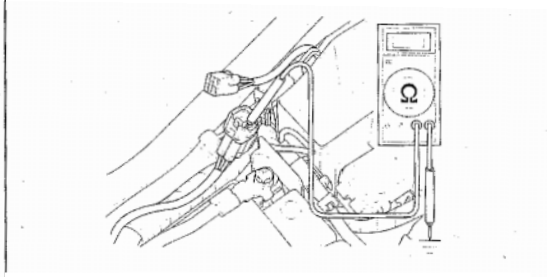
Connection: White – White
Standard: 10 – 40 Ω

Out of range → • Faulty O_2 sensor

Normal

Check for continuity White terminal and ground.

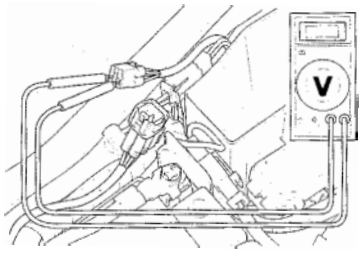
Continuity → • Faulty O_2 sensor



Connection: White – Ground
Standard: No continuity

No continuity

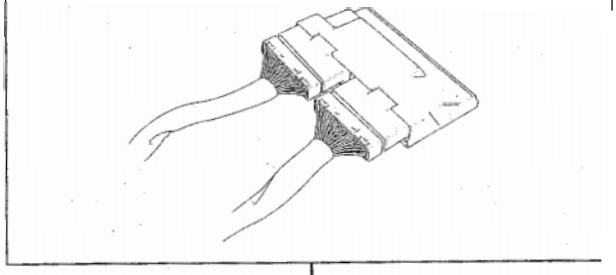
Turn the ignition switch to "ON".
Measure the voltage at the O_2 sensor wire harness side connector terminals.



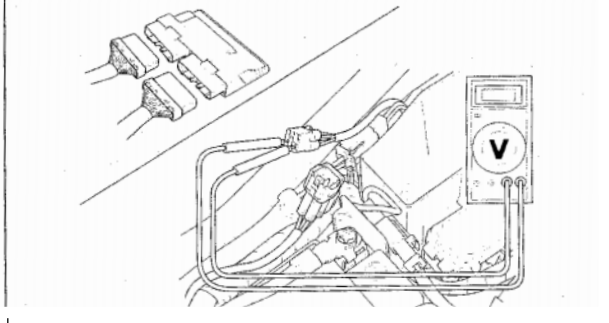
Connection: Black/White (+) – Black/Green (–)
Standard: Battery voltage

Normal →

Turn the ignition switch to "OFF".
Disconnect the ECM 26P connector.



Turn the ignition switch to "ON".
Measure the voltage at the O_2 sensor wire harness side connector terminals.



Connection: Black/White (+) – Black/Green (–)
Standard: Battery voltage

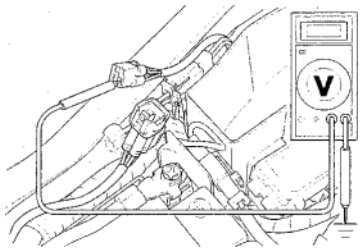
Battery voltage

• Open circuit in O_2 sensor Black/Green wires

No voltage

• Replace the ECM and inspect again

Measure the voltage at the O_2 sensor wire harness side connector terminal and ground.



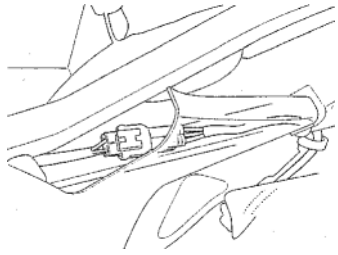
Connection: Black/White (+) – Ground (–)
Standard: Battery voltage

No voltage → • Open circuit in Black/White wire between the O_2 sensor and engine stop relay

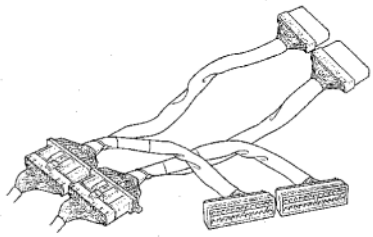
Battery voltage ↓

Turn the ignition switch to "OFF".

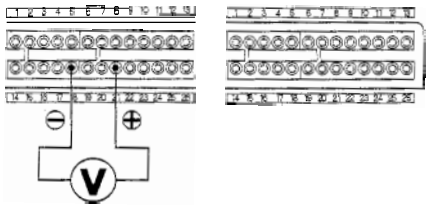
Connect the O_2 sensor **4P** connectors.



Disconnect the ECM connectors.
Connect the test harness to the wire harness connectors.



Turn the ignition switch to "ON".
Measure the voltage at the test harness terminals.



Connection: B20 (+) – A18 (–)
Standard: Battery voltage

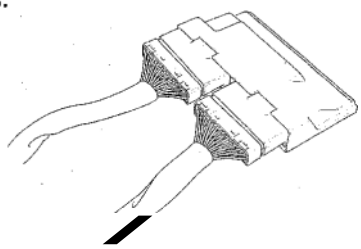
No voltage → • Open circuit in Black/Green wire between the ECM connector and O_2 sensor 4P connector

Battery voltage → • Replace the ECM and inspect again

PGM-FI MIL 33 BLINKS (E^2-PROM)

Turn the ignition switch to "OFF".

Disconnect the ECM connectors.
Check for loose or poor contact of the ECM connectors.



Connect the ECM connectors.
Short the service check connector with a jumper wire (page 5-6).
Turn the ignition switch to "ON" and check that the MIL blinks.

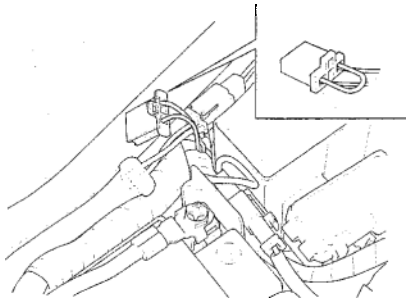
33 blinks → Reset the self-diagnosis memory data (page 5-7).
Turn the ignition switch to "ON" and check that the MIL blinks.

33 blinks → • Replace the ECM

Except 33 blinks

Does not blink 33 times

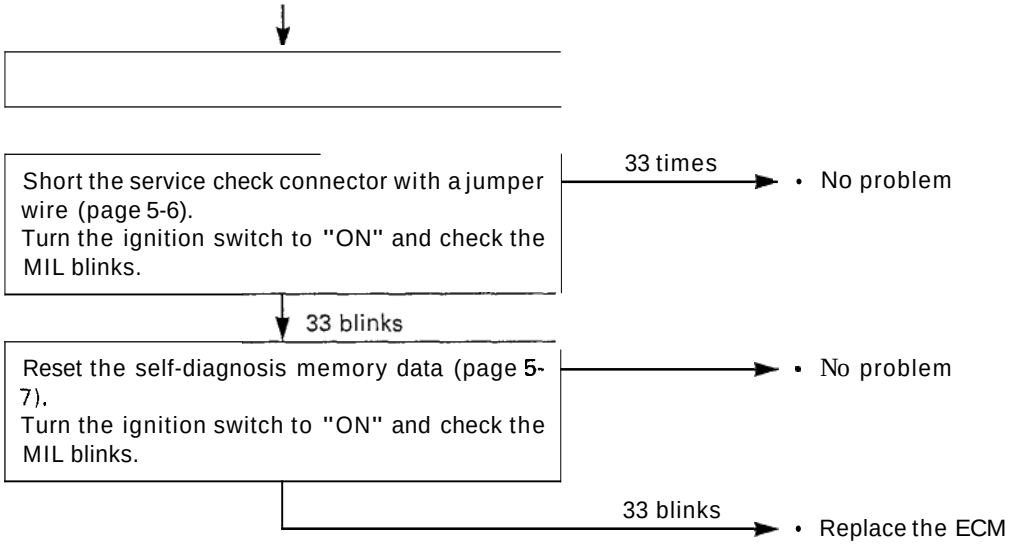
Remove the jumper wire from the service check connector.



Turn the ignition switch to "ON" and check that the MIL blinks.

Does not blink 33 times → • No problem

33 blinks

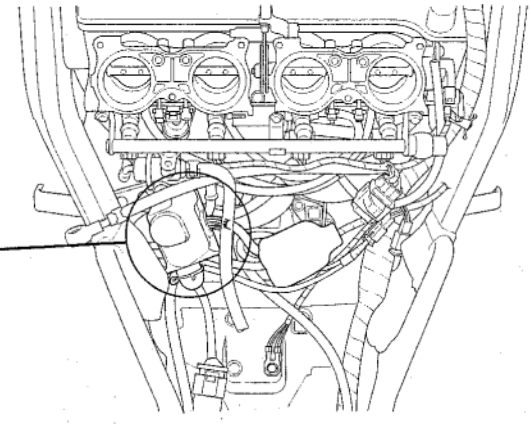

Short the service check connector with a jumper wire (page 5-6).
Turn the ignition switch to "ON" and check the MIL blinks.
33 times
• No problem
33 blinks
Reset the self-diagnosis memory data (page 5-7).
Turn the ignition switch to "ON" and check the MIL blinks.
• No problem
33 blinks
• Replace the ECM

PGM-FI MIL 34 BLINKS (EGCV AND AIR INTAKE VALVE SERVO MOTOR VOLTAGE)

Turn the ignition switch to "OFF".

↓

Disconnect the servo motor 6P connector.
Check for loose or poor contact on the servo motor 6P connector.



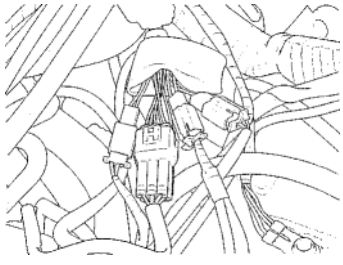
↓

Connect the servo motor 6P connector.
Place the motorcycle on its side stand.
Turn the ignition switch to "ON" and check that the MIL blinks.

Does not blink → • Loose or poor contact on the servo motor 6P connector

↓ 34 blinks

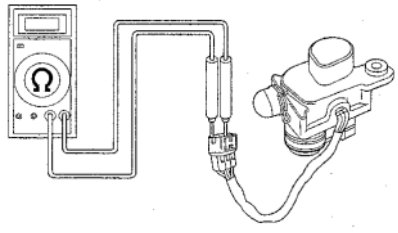
Turn the ignition switch to "OFF" and the engine stop switch to "OFF".
Disconnect the servo motor 6P connector.



↓

Measure the resistance at the servo motor 6P connector terminals.

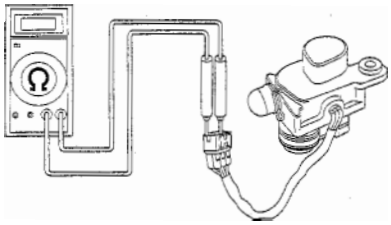
Abnormal → • Faulty servo motor



Connection: Yellow/Red (+) – Green/Orange (–)
Standard: 5 kΩ (20°C/68°F)

↓ Normal

Measure the resistance at the servo motor 6P connector terminals.

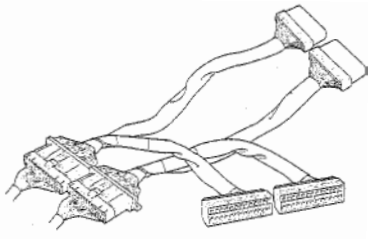


Connection: Light green/Pink (+) – Green/Orange (–)
Standard: 0 – 5 kΩ (20°C/68°F)

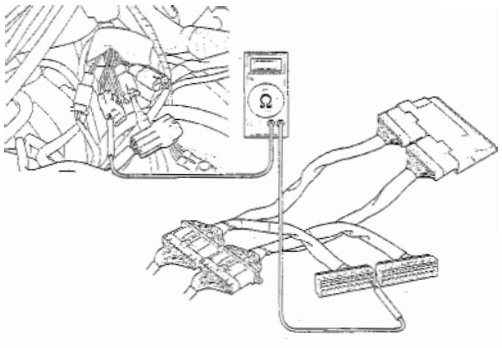
Abnormal → • Faulty servo motor

Normal ↓

Disconnect the ECM connectors.
Connect the test harness to the wire harness connectors.



Check for continuity between the test harness terminal and servo motor 6P connector terminals.



Connection: A15 – Red
A3 – Blue
A26 – Green/Orange
B15 – Yellow/Red
B9 – Light green/Pink
Standard: Continuity

No continuity → • Short circuit in related wire

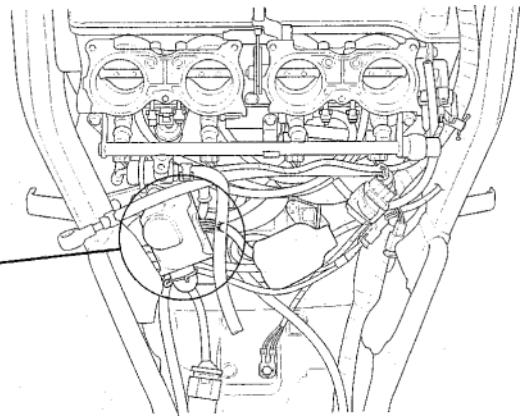
Continuity → • Replace the ECM with a new one, and inspect it again.

PGM-FI MIL 35 BLINKS (EGCV AND AIR INTAKE VALVE SERVO MOTOR)

Turn the ignition switch to "OFF".

↓

Disconnect the servo motor 6P connector.
Check for loose or poor contact on the servo motor 6P connector.



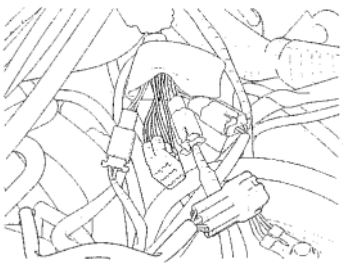
↓

Connect the servo motor 6P connector.
Place the motorcycle on its side stand.
Turn the ignition switch to "ON" and check that the MIL blinks.

Does not blink → • Loose or poor contact on the servo motor 6P connector

↓ 35 blinks

Turn the ignition switch to "OFF" and the engine stop switch to "OFF".
Disconnect the servo motor 6P connector.



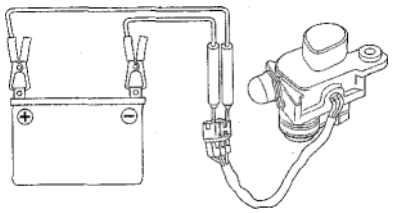
↓

Disconnect the control cables from the servo motor.
Turn the ignition switch to "ON" and check that the MIL blinks.

No blinks → • Check the EGCV, air intake valve and cables.

↓ 35 blinks

Remove the servo motor (page 5-95).
Connect the 12 V battery to the servo motor connector terminals and check the servo motor function.

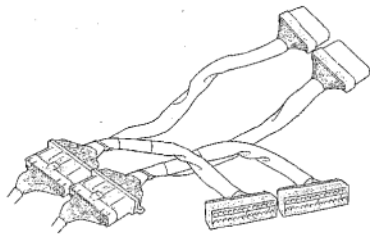


Connection: Red (+) – Blue (–)

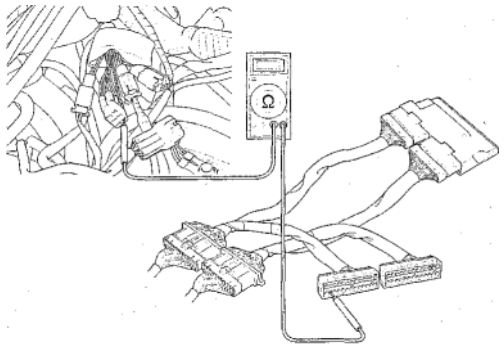
Abnormal → • Faulty servo motor

↓ Normal

Disconnect the ECM connectors.
Connect the test harness to the wire harness connectors.



Check for continuity between the test harness terminal and servo motor 6P connector terminals.



Connection: A15 – Red
A3 – Blue
Standard: Continuity

No continuity → • Short circuit in related wire

Continuity → • Replace the ECM with a new one, and inspect it again.

FUEL PRESSURE INSPECTION

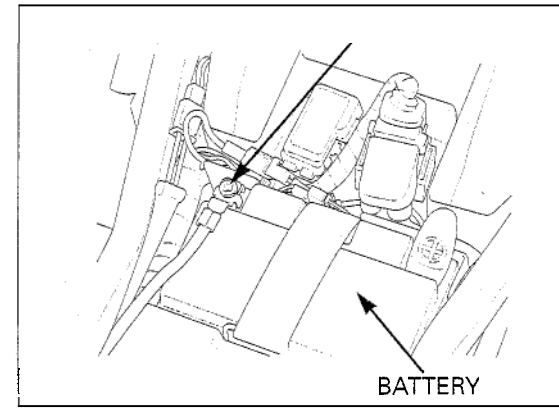
NOTICE

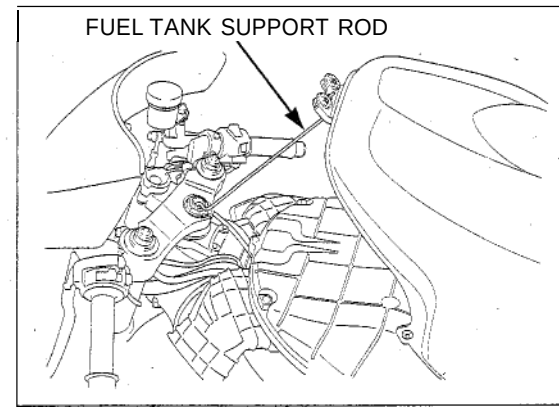
- *Before disconnecting fuel hoses, release the fuel pressure by loosening the fuel hose banjo bolt at the fuel tank.*
- *Always replace the sealing washers when the fuel hose banjo bolt is removed or loosened.*

Remove the seat (page 2-2).

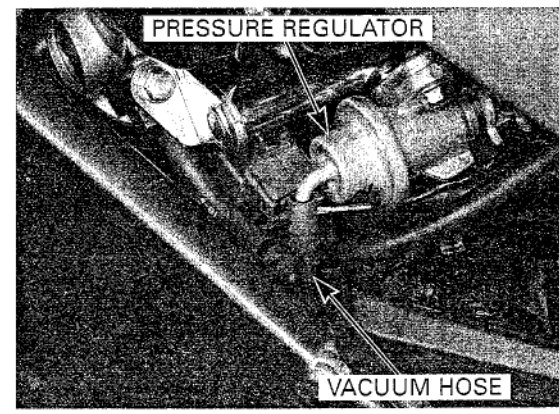
Disconnect the battery negative cable from the battery terminal.

Open and support the front end of the fuel tank (page 3-4).



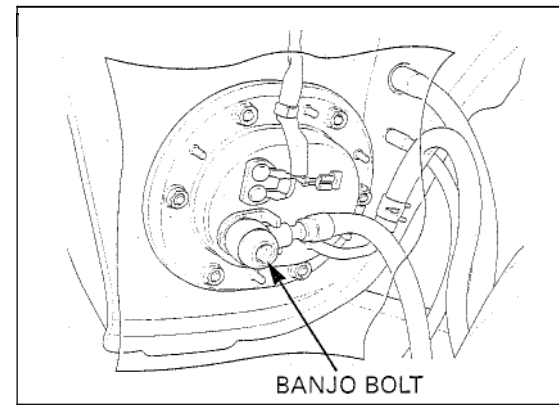


Disconnect the pressure regulator vacuum hose and plug the vacuum hose.



Cover the fuel hose banjo bolt with a rag or shop towel.

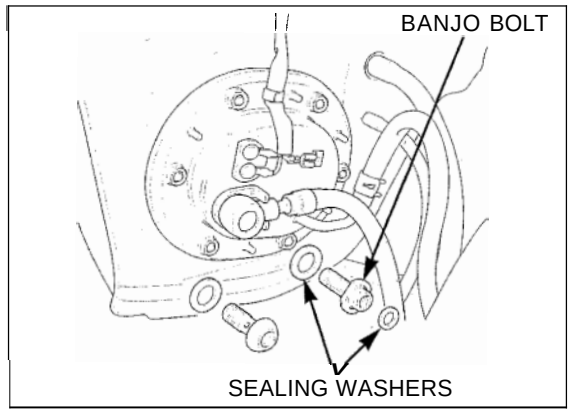
Slowly loosen the fuel hose banjo bolt and catch the remaining fuel using a approved gasoline container.



Remove the fuel hose banjo bolt and attach the fuel pressure gauge with the following Honda genuine parts.

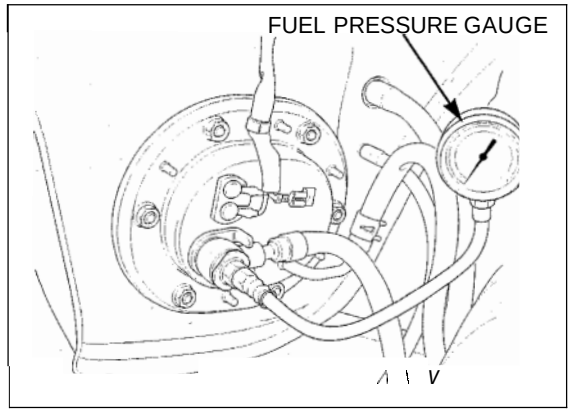
Banjo bolt, 12 mm
Parts No. 90008–PD6–010
Sealing washer, 12 mm
Parts No. 90428–PD6–003
Sealing washer, 6 mm
Parts No. 90430–PD6-003

TOOL:
Fuel pressure gauge **07406–0040003 or 07406–004000A (U.S.A. only)**



Connect the battery negative cable.
Start the engine.
Read the fuel pressure at idle speed.

IDLE SPEED: 1,200 ± 100 rpm
STANDARD: 343 kPa (3.5 kgf/cm², 50 psi)

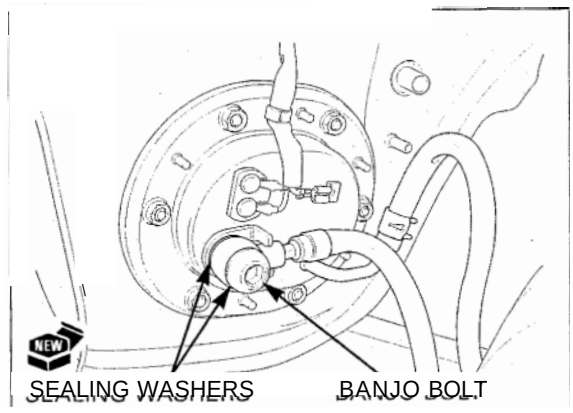


If the fuel pressure is higher than specified, inspect the following:
– Pinched or clogged fuel return hose
– Pressure regulator
– Fuel pump (page 5-57)

If the fuel pressure is lower than specified, inspect the following:
– Fuel line leaking
– Clogged fuel filter
– Pressure regulator
– Fuel pump (page 5-57)

After inspection, remove the fuel hose banjo bolt and reinstall and tighten the original fuel hose banjo bolt using the new sealing washers.

TORQUE: 22 N·m (2.2 kgf·m, 16 lbf·ft)

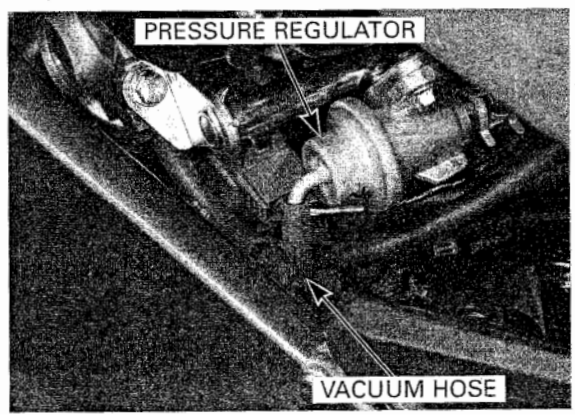


NOTICE

Always replace the sealing washers when the fuel hose banjo bolt is removed or loosened.

Connect the pressure regulator vacuum hose.

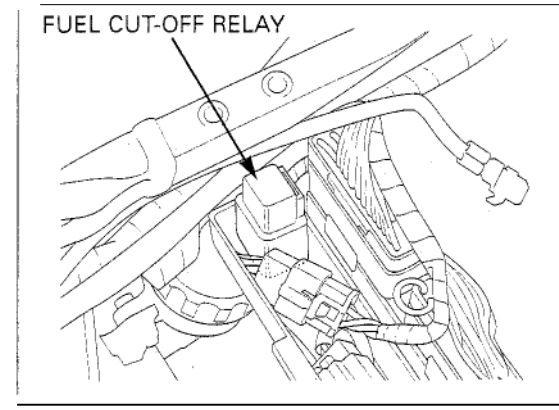
Install the removed parts in the reverse order of removal.



FUEL FLOW INSPECTION

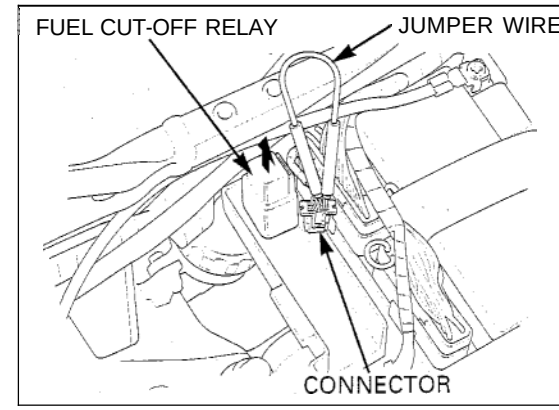
Remove the seat (page 2-2).
Open and support the front end of the fuel tank (page 3-4).

Remove the ECM cover and disconnect the fuel cut-off relay connector.



Jump the Brown and Black/White wire terminals of the wire harness side using a jumper wire.

- When the fuel return hose is disconnected, gasoline will spill out of the hose. Place an approved gasoline container under the hose and drain the gasoline.
- Wipe off any spilled out gasoline.

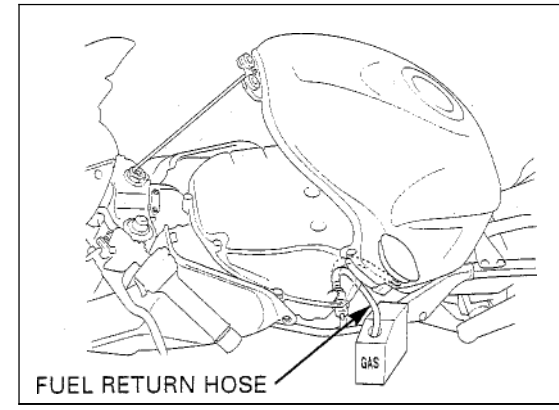


Disconnect the fuel return hose at the pressure regulator, plug the pressure regulator inlet joint.

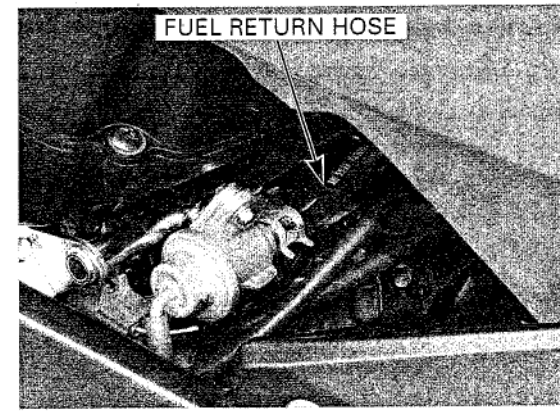
Turn the ignition switch to "ON" for 10 seconds.
Measure the amount of fuel flow.

Amount of fuel flow:
188 cm³ (6.4 US oz, 6.6 Imp oz) minimum/ 10 seconds

If the fuel flow is less than specified, inspect the following:
- Pinched or clogged fuel hose and fuel return hose
- Clogged fuel filter
- Pressure regulator
- Fuel pump (page 5-57)



After inspection, connect the fuel return hose.
Start the engine and check for leak.



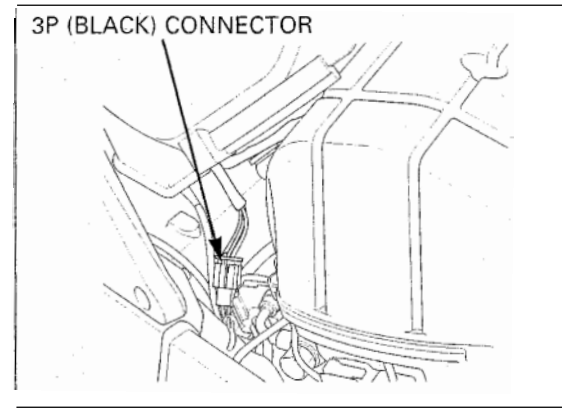
FUEL PUMP

INSPECTION

Turn the ignition switch to "ON" and confirm that the fuel pump operates for a few seconds.
If the fuel pump does not operate, inspect as follows:

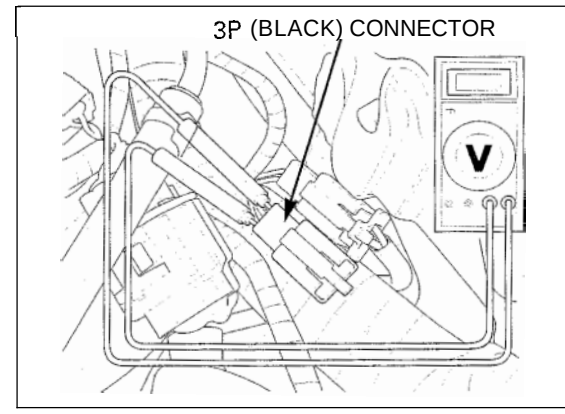
Open and support the front end of the fuel tank (page 3-4).

Disconnect the fuel pump 3P (Black) connector.



Turn the ignition switch to "ON" and measure the voltage between the terminals.

Connection: Brown (+) **– Green** (–)



There should be battery voltage for a few seconds.

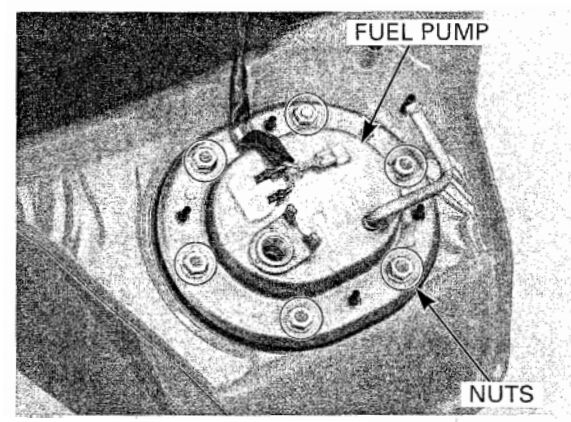
If there is battery voltage, replace the fuel pump.
If there is no battery voltage, inspect the following:
- Main fuel 30A
- Sub fuse 10A, 20A
- Engine stop switch (page 19-17)
- Fuel cut-off relay (page 5-58)
- Bank angle sensor (page 5-85)
- Engine stop relay (page 5-86)
- ECM (page 5-88)

REMOVAL

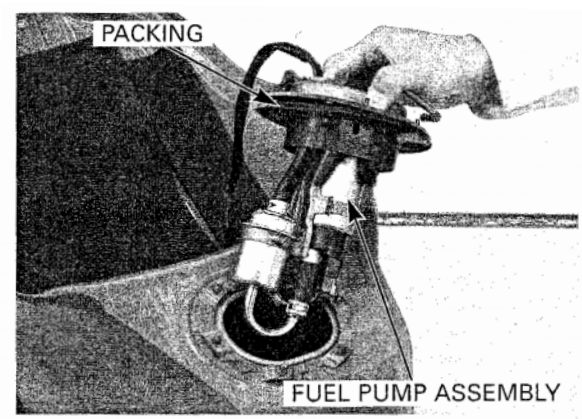
Before disconnecting the fuel hose, release the fuel pressure by loosening the fuel hose banjo bolt at the fuel tank.
Always replace the sealing washers when the fuel hose banjo bolt is removed or loosened.

Remove the fuel tank (page 5-59).

Remove the fuel pump mounting nuts.



Remove the fuel pump assembly and packing

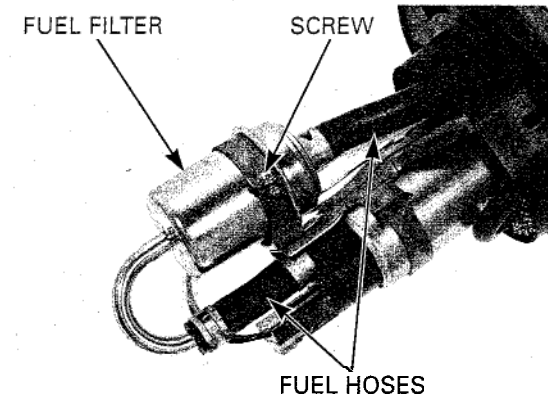


FUEL FILTER REPLACEMENT

Disconnect the fuel hoses from the fuel filter.
Remove the screws and fuel filter.

Note the direction of the fuel filter.

Install the fuel filter in the reverse order of removal.

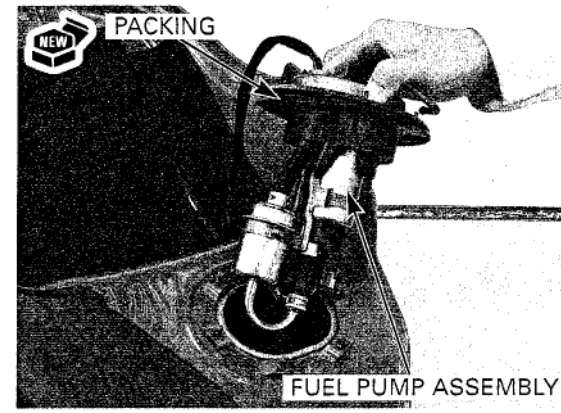


INSTALLATION

Always replace packing with a new one

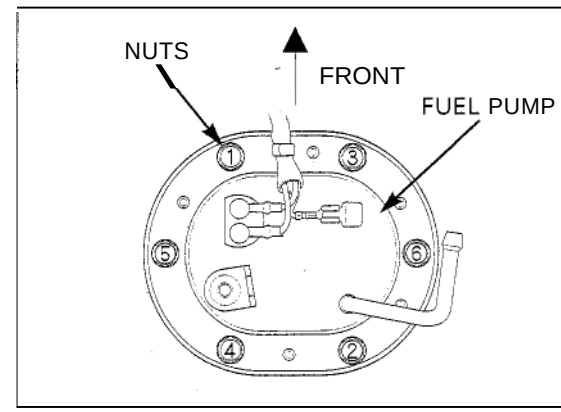
Place a new packing onto the fuel pump.

Install the fuel pump being careful not to damage the fuel pump wire.



Install and tighten the fuel pump mounting nuts in the sequence shown.

TORQUE: 12 N•m (1.2 kgf•m, 9 lbf•ft)

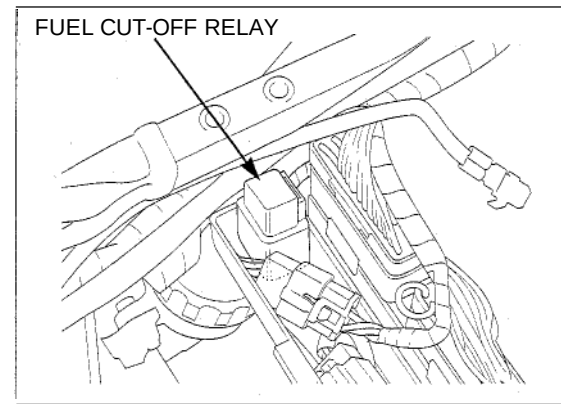


FUEL CUT-OFF RELAY

INSPECTION

Remove the ECM cover (page 5-87).

Disconnect the fuel cut-off relay 4P connector, remove the fuel cut-off relay.



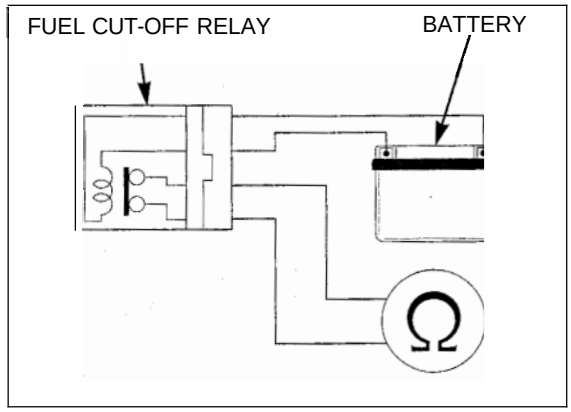
Connect the ohmmeter to the fuel cut-off relay connector terminals.

CONNECTION: Black/White – Brown

Connect the 12V battery to the following fuel cut-off relay connector terminals.

CONNECTION: Brown/Black – Black/White

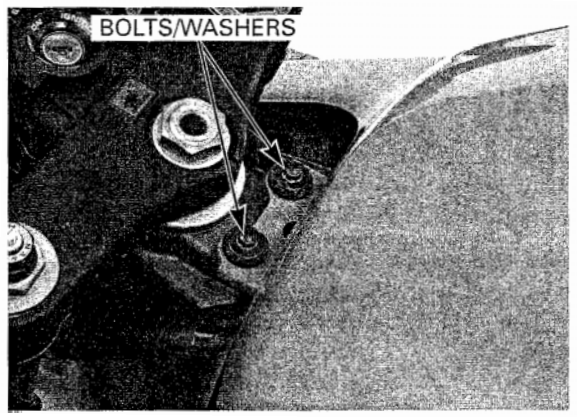
There should be continuity only when the 12V battery is connected.
If there is no continuity when the 12V battery is connected, replace the fuel cut-off relay.



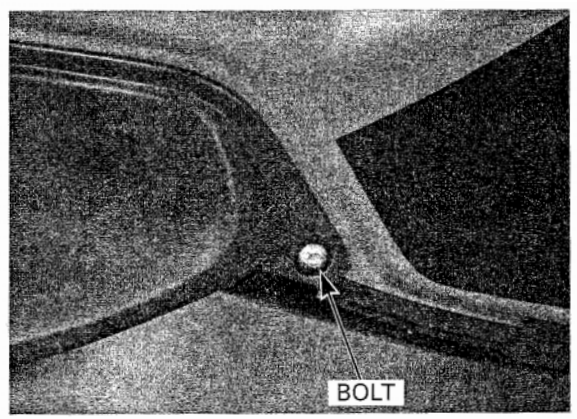
FUEL TANK

REMOVAL

Remove the seat (page 2-2).
Remove the fuel tank front mounting bolts and washers.

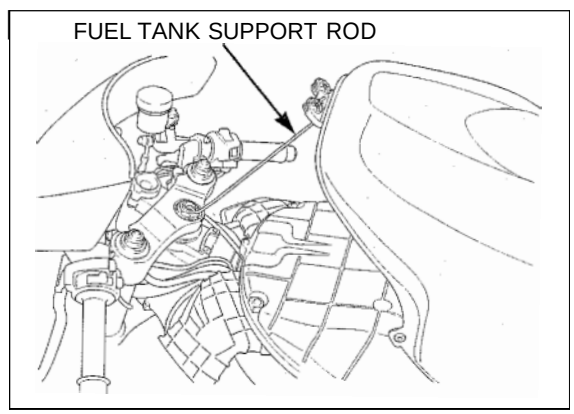


Remove the right and left duct cover mounting bolts.

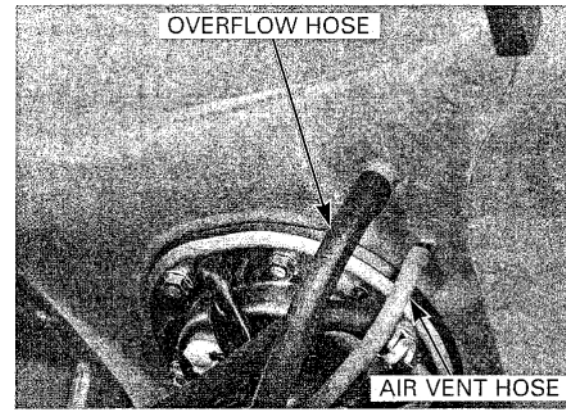


Open and support the front end of the fuel tank (page 3-4).

Release the fuel pressure (page 5-54).



Disconnect the fuel tank air vent hose and overflow hose.

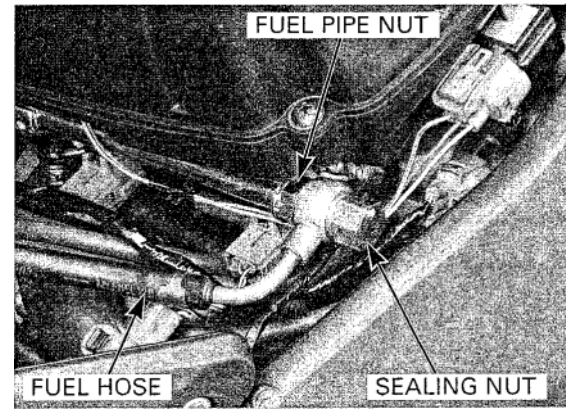


Hold the fuel pipe nut and remove the fuel hose sealing nut and sealing washers, then disconnect the fuel hose.

NOTICE

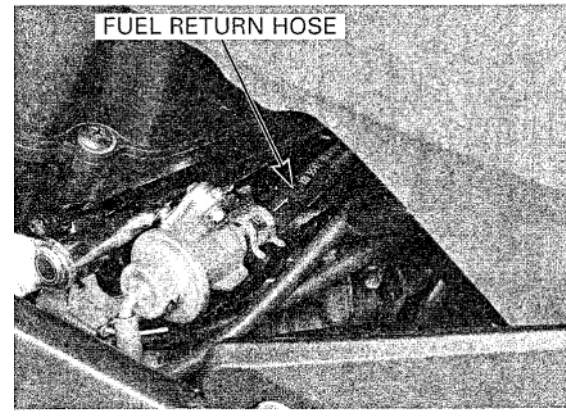
Do not apply excessive force to the fuel pipe.

- Always hold the fuel pipe nut while removing the fuel hose sealing nut.
- Do not disconnect the fuel hose and fuel return hose on the fuel tank side; they must be disconnected on the throttle body side.

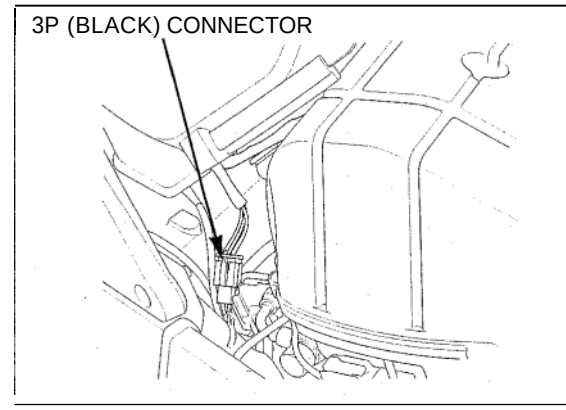


Temporarily install the 12 x 30 mm bolt (pitch 1.25) and sealing washers to the fuel hose banjo, then tighten the sealing nut.

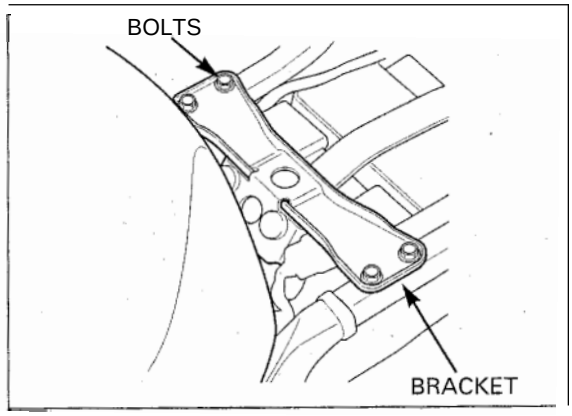
Disconnect the fuel return hose at the pressure regulator.



Disconnect the fuel pump/reserve sensor 3P (Black) connector.



Remove the fuel tank bracket bolts and then remove the fuel tank from the frame.



Be careful not to damage the fuel tank.

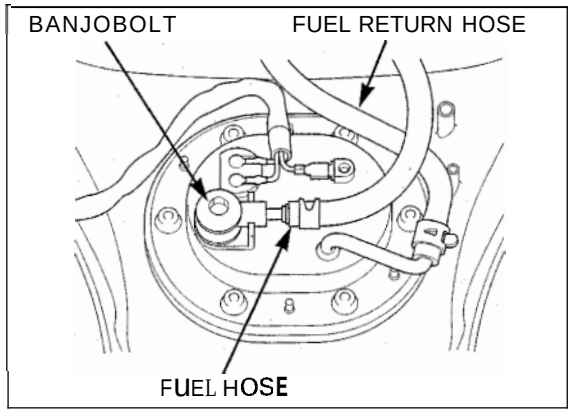
Place the fuel tank upside down.

Remove the fuel hose banjo bolt and sealing washers, then remove the fuel hose from the fuel pump.

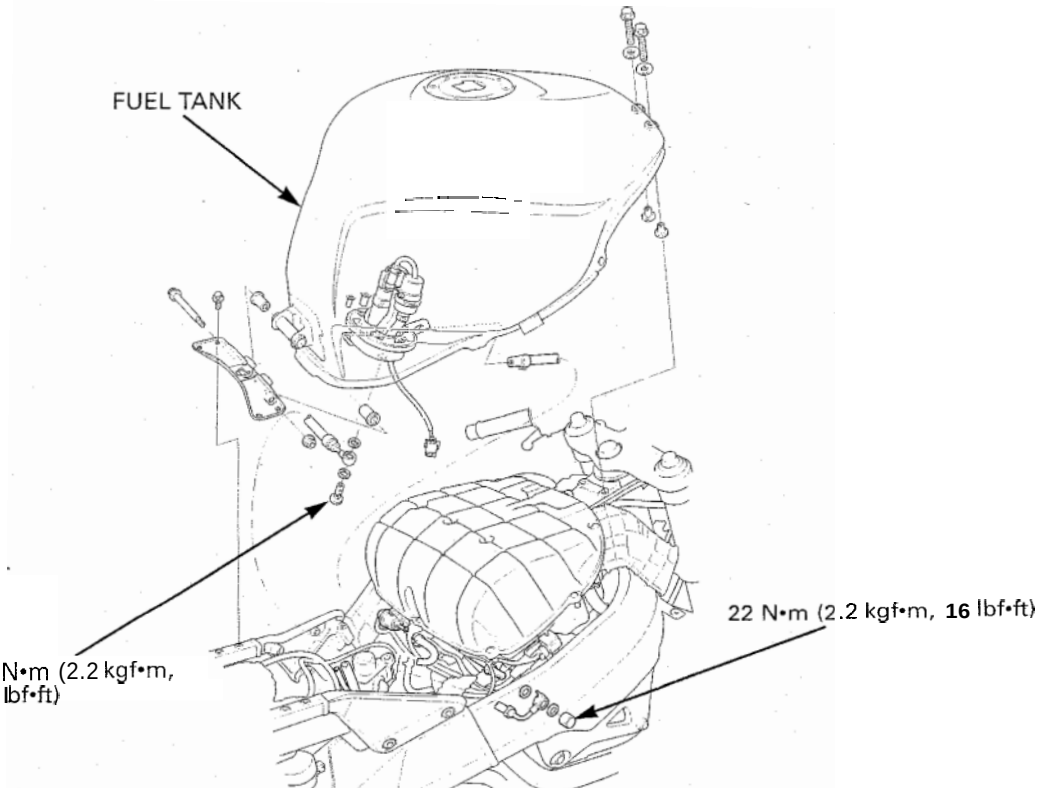
Disconnect the fuel return hose while supporting the return pipe by hand.

Disconnect the fuel return hose from the fuel pump.

Refer to page 5-57 for fuel pump removal.



INSTALLATION



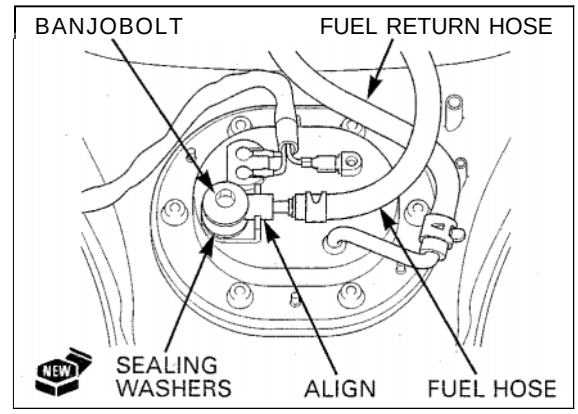
Align the fuel hose eyelet joint with the stopper on the fuel pump

Connect the fuel hose to the fuel pump with new sealing washers.

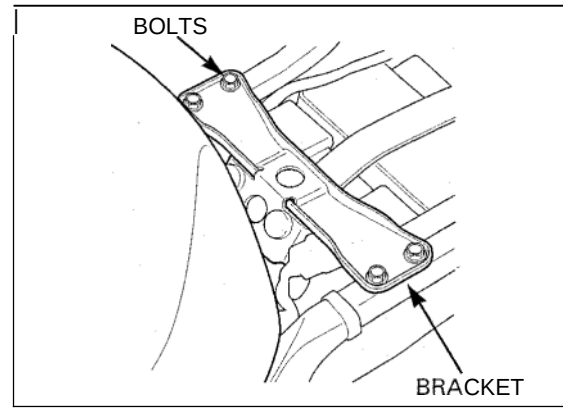
Install and tighten the fuel hose banjo bolt to the specified torque.

TORQUE: 22 N·m (2.2 kgf·m, 16 lbf·ft)

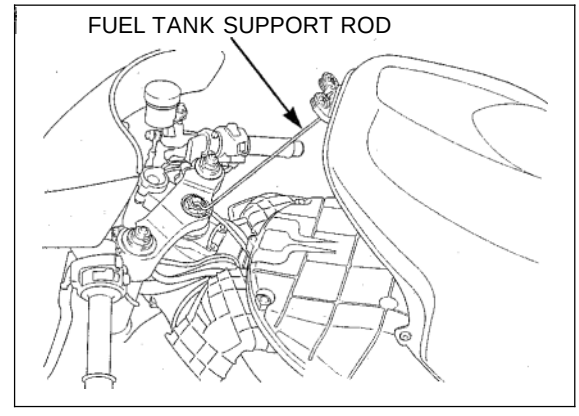
Connect the fuel return hose to the fuel pump.



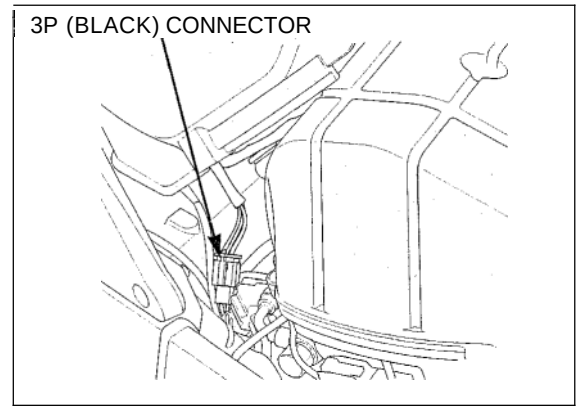
Install the fuel tank onto the frame, temporarily install the fuel tank rear mounting bolt.



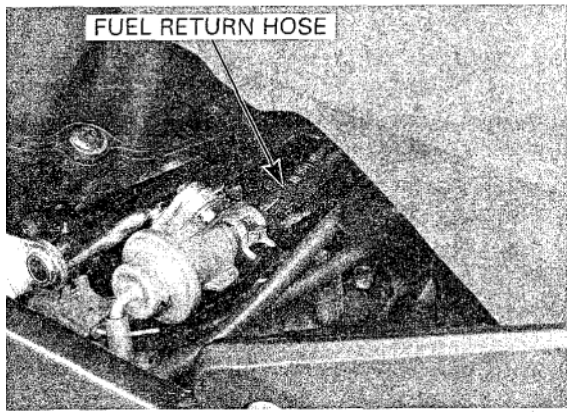
Support the front end of the fuel tank (page 3-4).



Connect the fuel pump/reserve sensor 3P (Black) connector.



Connect the fuel return hose to the pressure regulator.

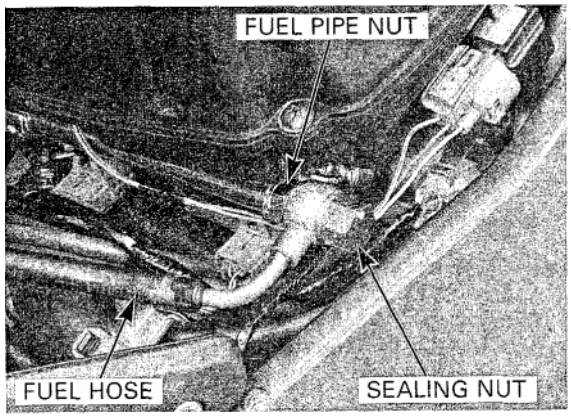


Connect the fuel hose banjo to the throttle body with new sealing washers.
While pushing the fuel hose banjo stopper to the throttle body, install and tighten the sealing nut to the specified torque.

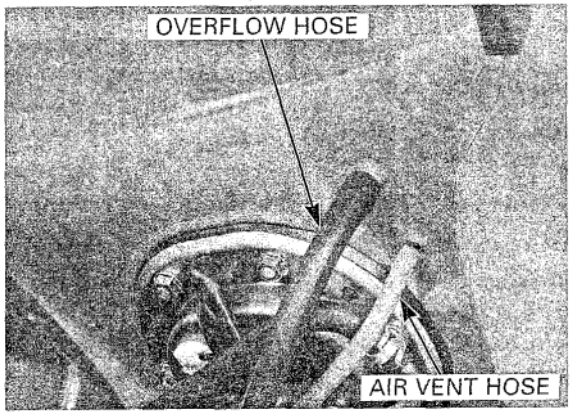
NOTICE

- *Do* not apply excessive force to the fuel pipe.
- Always *hold* the fuel pipe nut while tightening the fuel *hose* sealing nut.

TORQUE: 22 N·m (2.2 kgf·m, 16 lbf·ft)



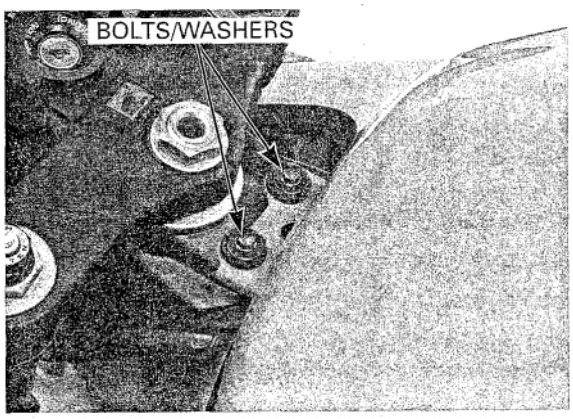
Connect the fuel tank air vent hose and overflow hose to the fuel tank.



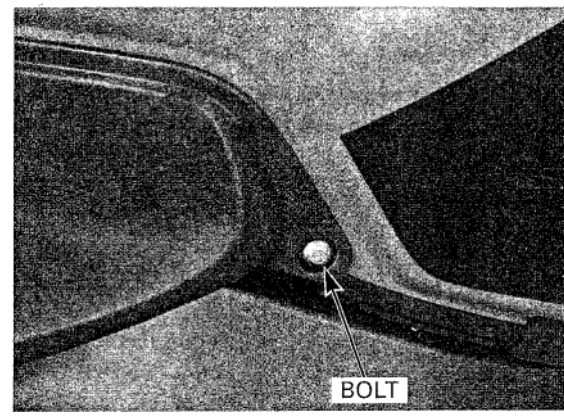
Install the fuel tank support rod into the seat properly (page 3-4)

Remove the support rod and close the fuel tank.

Install the fuel tank front mounting bolts and washers, then tighten the front and rear fuel tank mounting bolts.



Install and tighten the duct cover-to-fuel tank bolts.

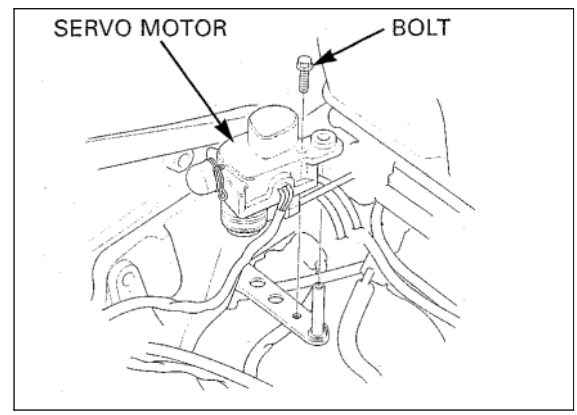


AIR CLEANER HOUSING

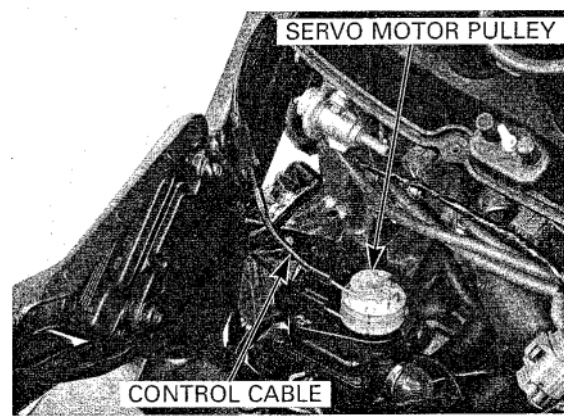
REMOVAL

Remove the air cleaner element (page 3-6).

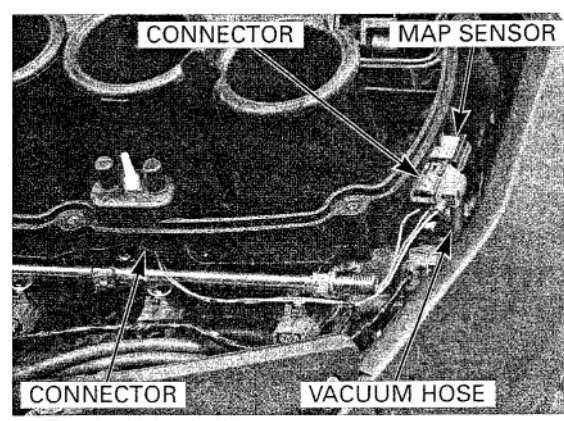
Remove the EGCV and air intake valve servo motor mounting bolt.



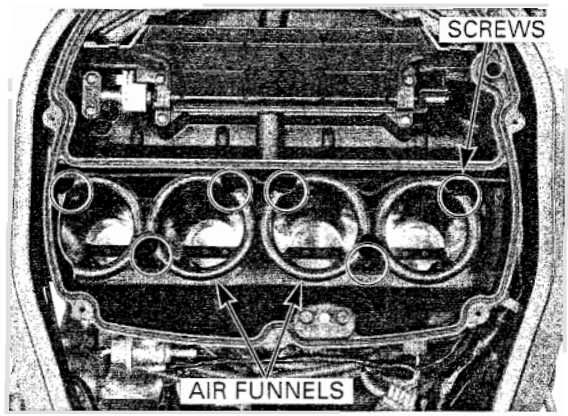
Remove the servo motor assembly from the bracket and disconnect the intake valve control cable from the servo motor pulley.



Disconnect the MAP sensor connector and vacuum hose.
Disconnect the IAT sensor connector.



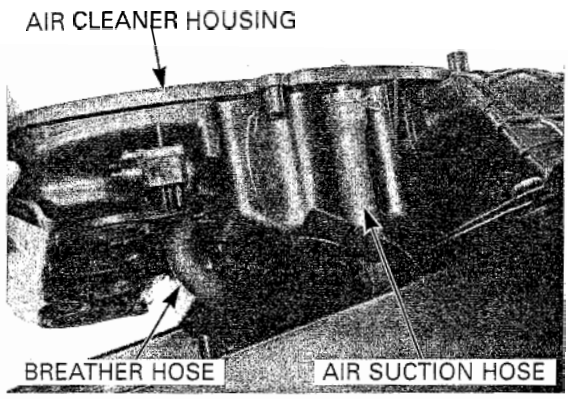
Remove the air funnel/air cleaner housing mounting screws, then remove the air funnels.



Disconnect the crankcase breather hose and PAIR control valve air suction hose from the air cleaner housing.

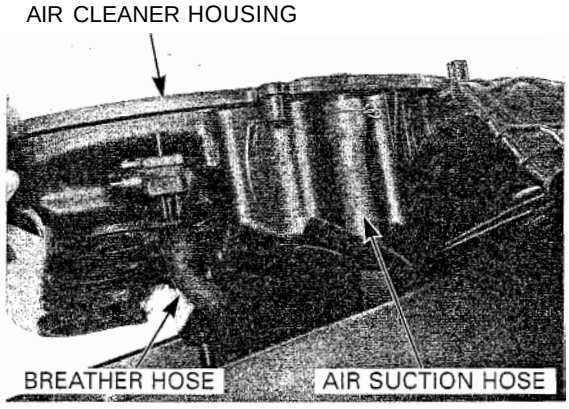
Remove the air cleaner housing.

See page 5-104 and 105 for intake air control valve disassembly/assembly.

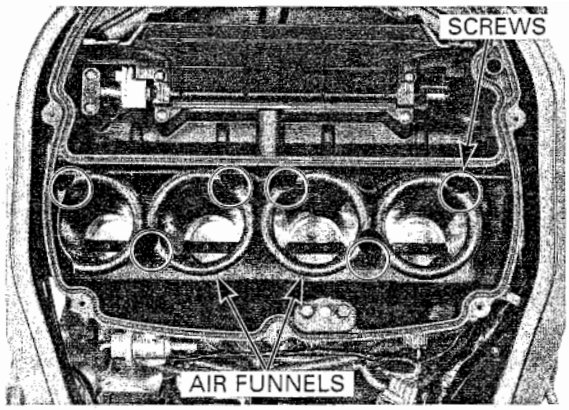


INSTALLATIQN

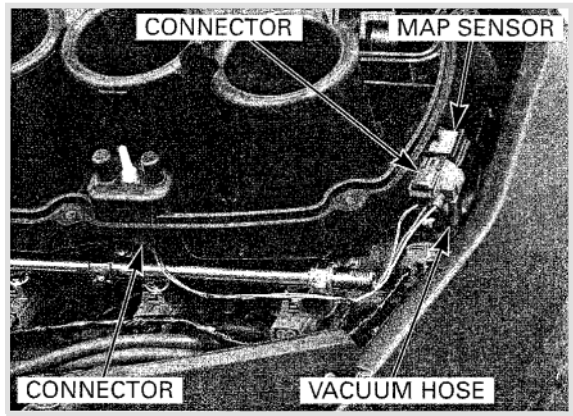
Route the variable intake air control valve wire properly, then install the air cleaner housing onto the throttle body.
Connect the crankcase breather hose and PAIR control valve air suction hose to the air cleaner housing.



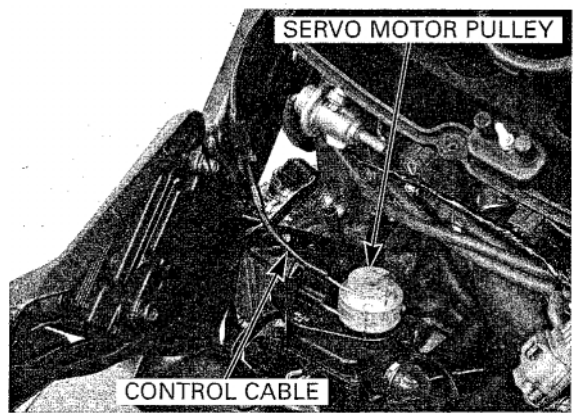
Install the air funnels in their proper locations.
Install and tighten the air funnel/air cleaner housing mounting screws.



Connect the MAP sensor connector and vacuum hose.
Connect the IAT sensor connector.

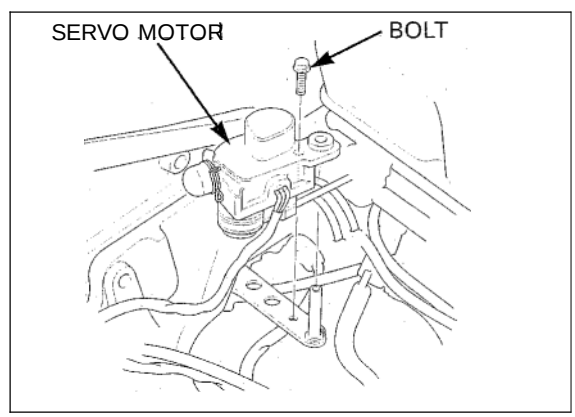


Connect the variable air intake control cable to the serve motor pulley.



Install the servo motor onto the bracket, tighten the bolt securely.

Install the air cleaner element (page 3-6).



THROTTLE BODY

REMOVAL

Do not snap the throttle valve from full open to full close after the throttle cable has been removed. It may cause incorrect idle operation

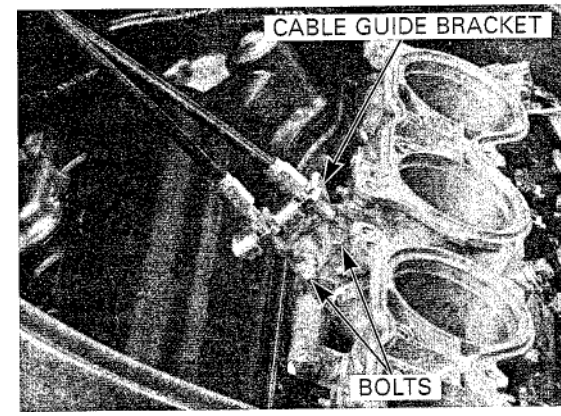
NOTICE

- *Before disconnecting the fuel hose, release the fuel pressure by loosening the fuel hose banjo bolt.*
- *Always replace the sealing washers when the fuel hose banjo bolt is removed or loosened.*

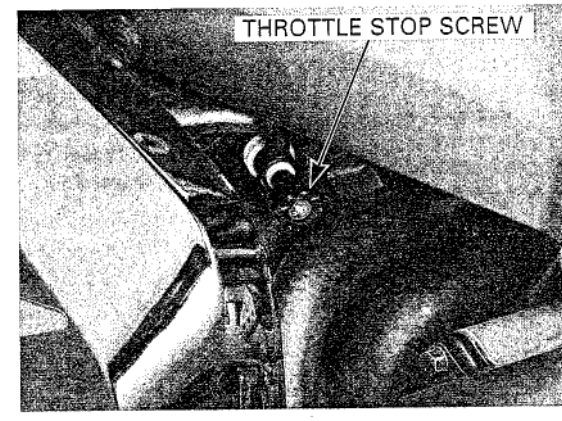
Drain the coolant from the cooling system (page 6-4).

Remove the following:
- Fuel tank (page 5-59)
- Air cleaner housing (page 5-64)

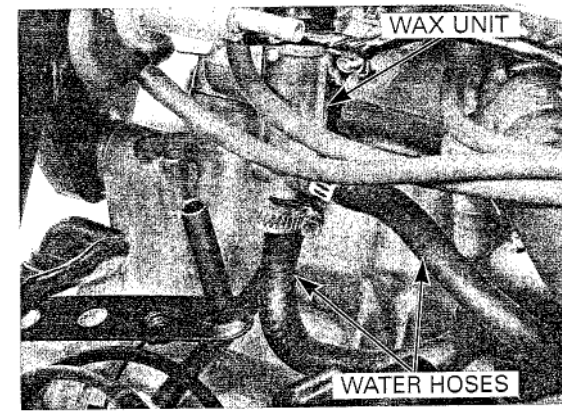
Remove the throttle cable guide bracket mounting bolts.
Disconnect the throttle cable ends from the throttle drum.



Remove the throttle stop screw knob from the bracket.

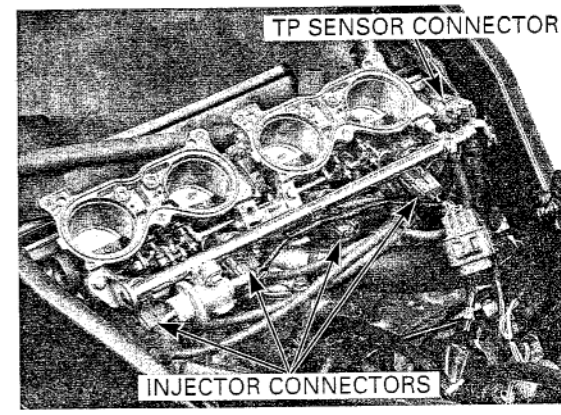


Loosen the hose band screws and disconnect the fast idle wax unit water hoses from the wax unit.



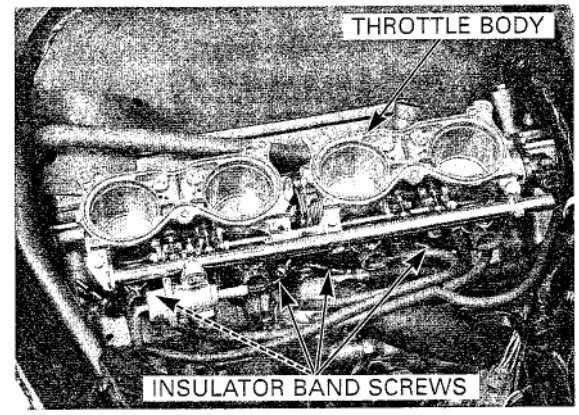
Disconnect the TP sensor connector and fuel injector connectors.

If you will not be disassembling the throttle body, disconnect the throttle body sub-harness multi-connector.



Loosen the engine side insulator band screws.

Remove the throttle body from the cylinder head.

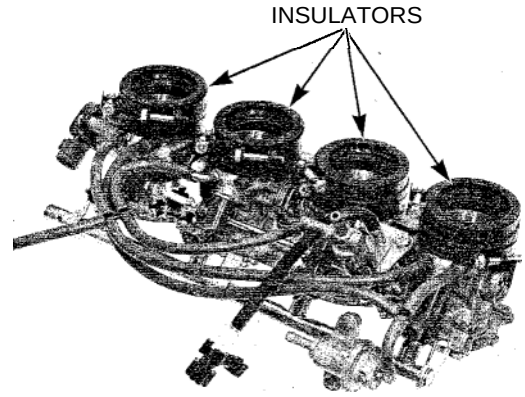


NOTICE

Do not hold the fuel pipe on the throttle body while removing the throttle body.

Do not snap the throttle valve from fuii open to fuii ciose after the throttle cable has been removed It may cause incorrect idle operation

Remove the insulators from the throttle body.



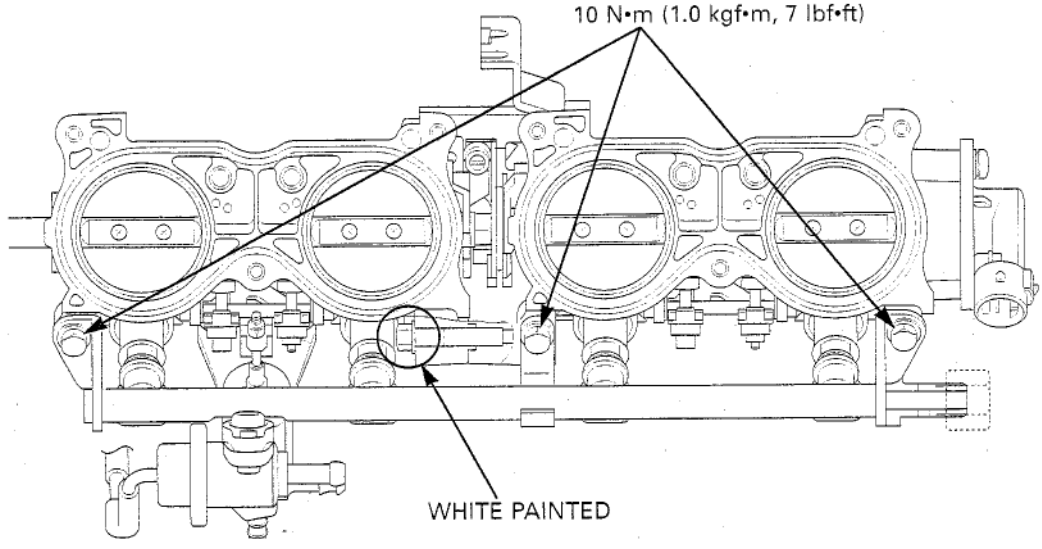
NOTICE

Seal the cylinder head intake ports with tape or a clean cloth to keep dirt and debris from entering the intake ports after the throttle body has been removed.

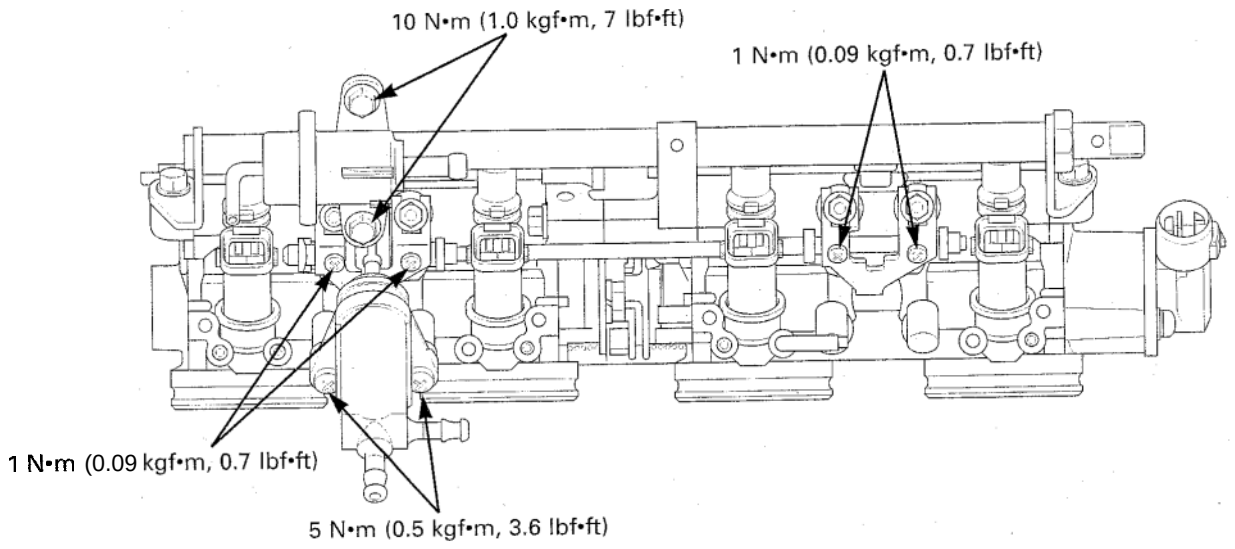
NOTICE

- *Do not damage the throttle body. It may cause incorrect throttle and idle valve synchronization.*
- *The throttle body is factory pre-set. Do not disassemble in a way other than shown in this manual.*
- *Do not loosen or tighten the white painted bolts and screws of the throttle body. Loosening or tightening them can cause throttle and idle valve synchronization failure.*

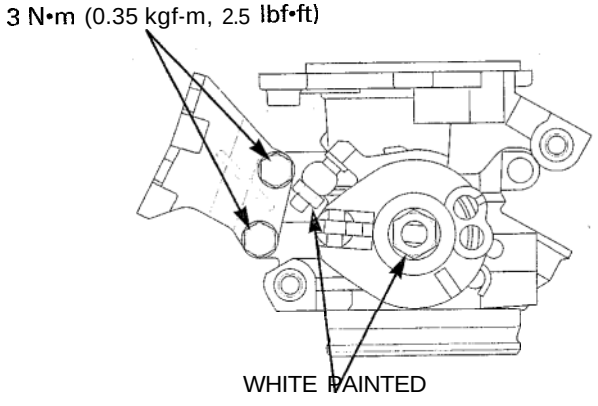
TOP VIEW:



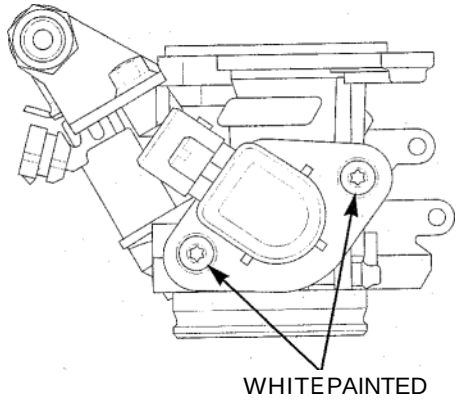
REAR VIEW:



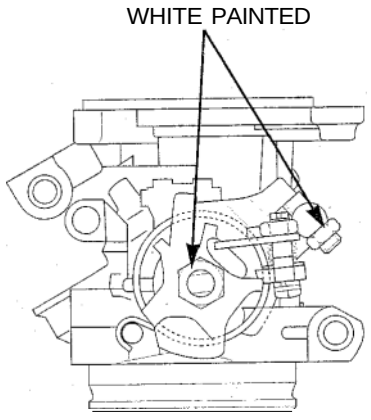
THROTTLE DRUM VIEW:



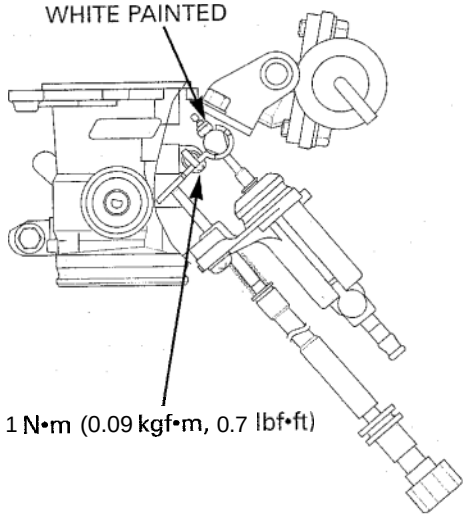
RIGHT SIDE VIEW:



THROTTLE LINK VIEW:

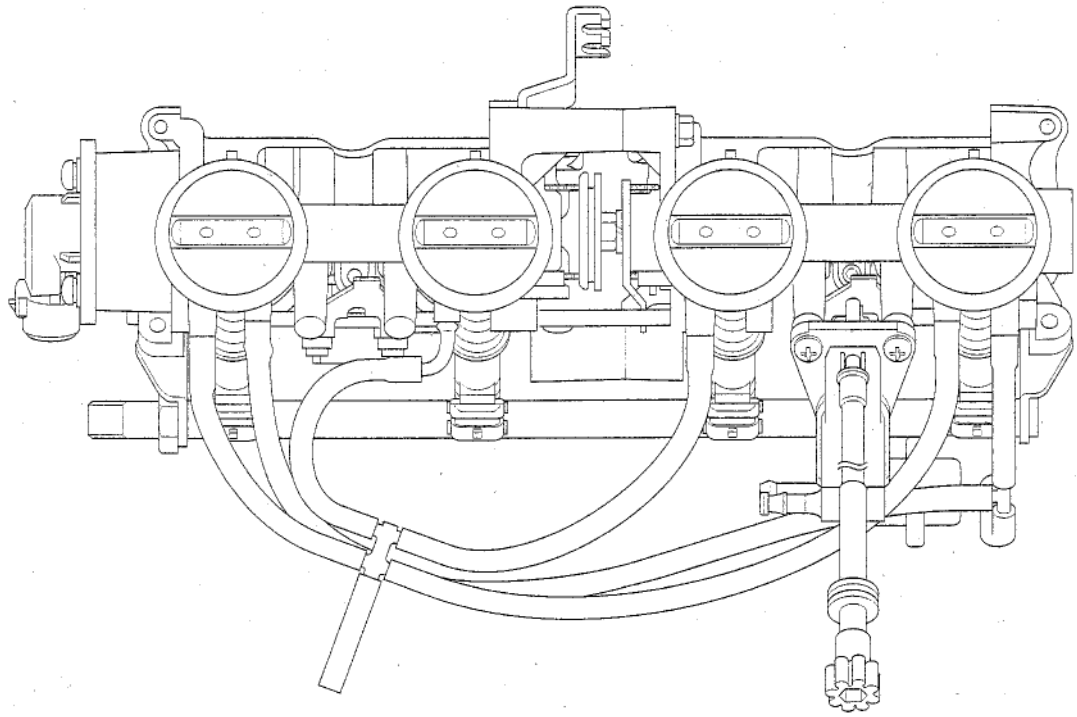


STARTER VALVE LINK VIEW:

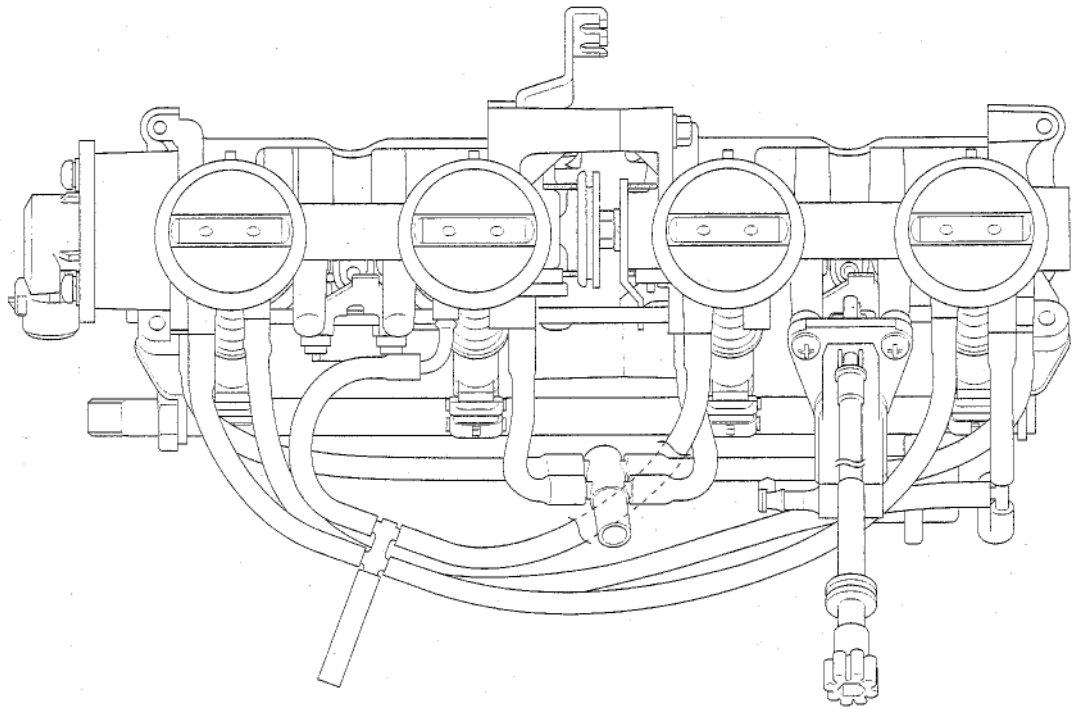


THROTTLE BODY VACUUM HOSE ROUTING

Non-California type:

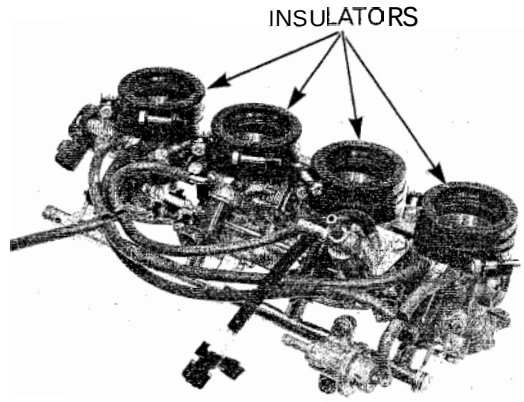


California type:



INSTALLATION

Check the insulator band angle.

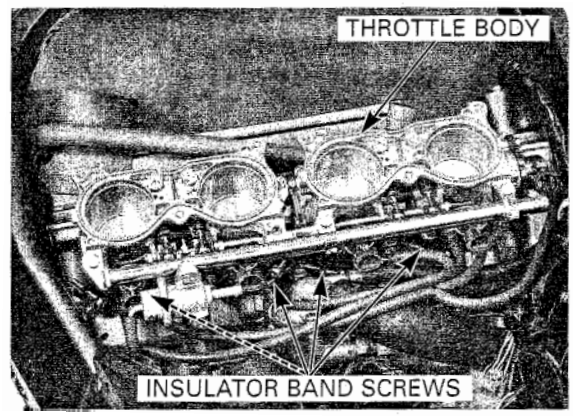


Apply oil to the insulator inside surfaces for ease of throttle body installation.

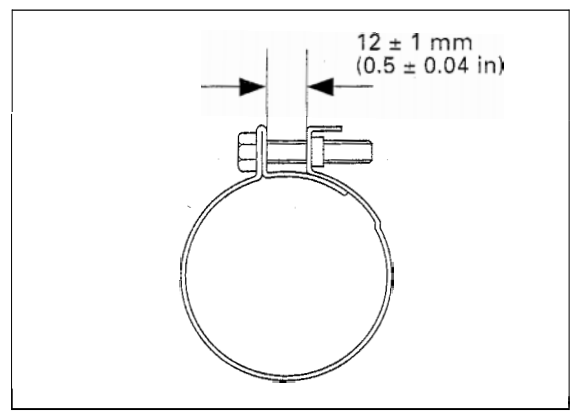
Install the throttle body onto the cylinder head.

NOTICE

Do not hold the fuel pipe on the throttle body while installing the throttle body.

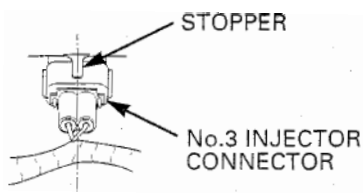


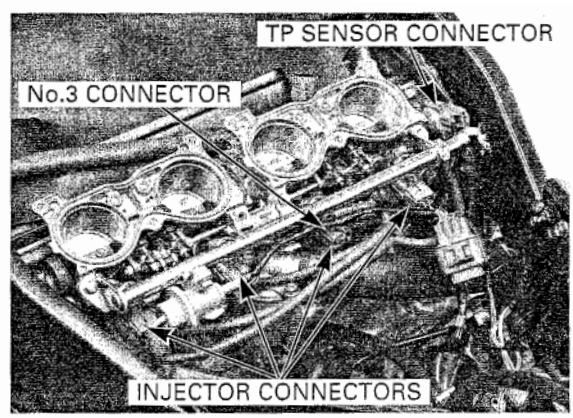
Tighten the insulator band so that the insulator band distance is 12 ± 1 mm (0.5 ± 0.04 in).



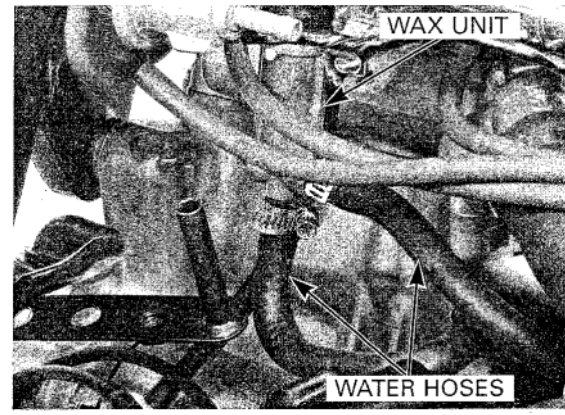
Do not confuse the TP sensor connector and MAP sensor connector; the throttle sensor connector wire is identified by the label "TPS"

Route the injector sub-harness referring the wiring diagram (page 1-27).
Connect the fuel injector connectors and TP sensor connector.
Connect the No.3 injector connector pallarel to the connector stopper.





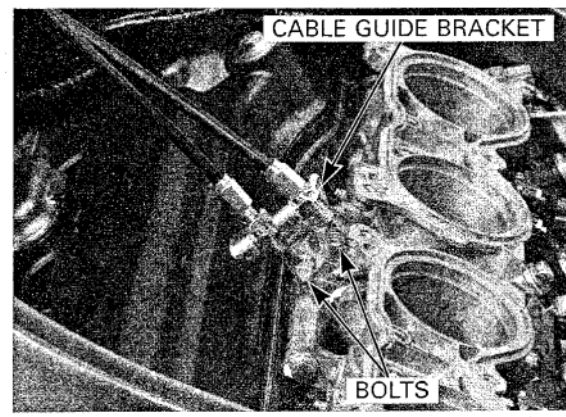
Connect the fast idle wax unit water hoses to the unit, then tighten the hose bands securely.



Connect the throttle cable ends to the throttle drum. Install the throttle cable guide bracket to the throttle body, then tighten the bolts to the specified torque.

TORQUE: 3 N•m (0.35 kgf•m, 2.5 lbf•ft)

Install the removed parts in the reverse order of removal.

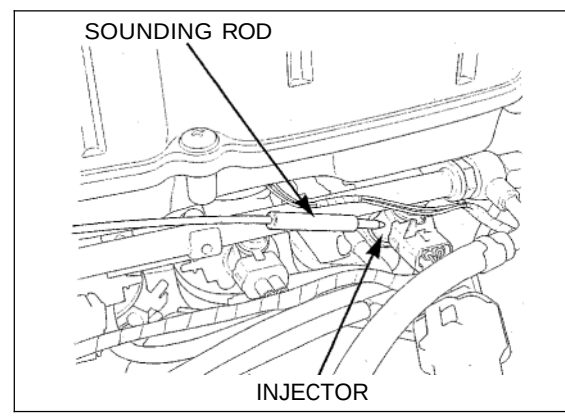


INJECTORS

INSPECTION

Start the engine and let it idle.
Confirm the injector operating sounds with a sounding rod or stethoscope.

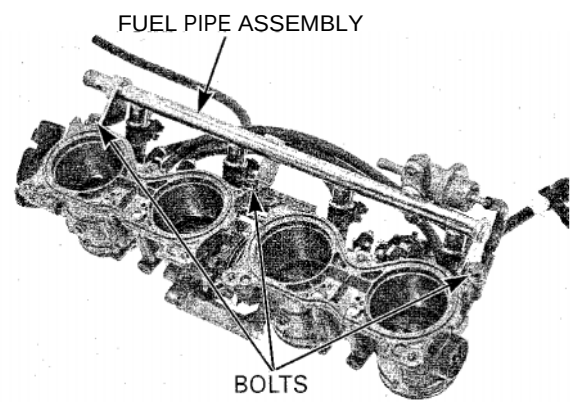
If the injector does not operate, replace it.



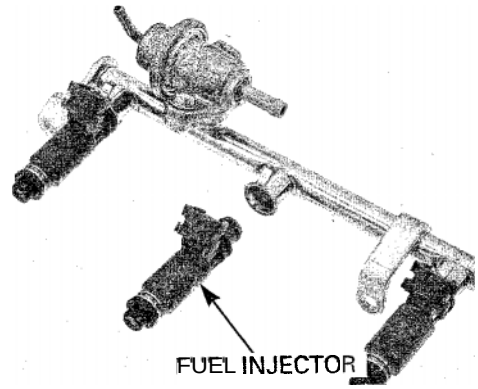
REMOVAL

Remove the throttle body (page 5-67).

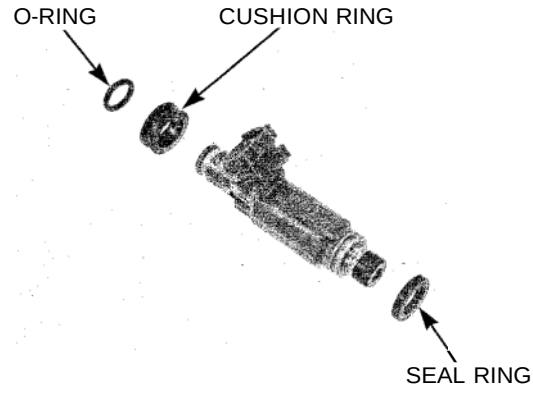
Remove the bolts and fuel pipe assembly.



Remove the injectors from the fuel pipe.



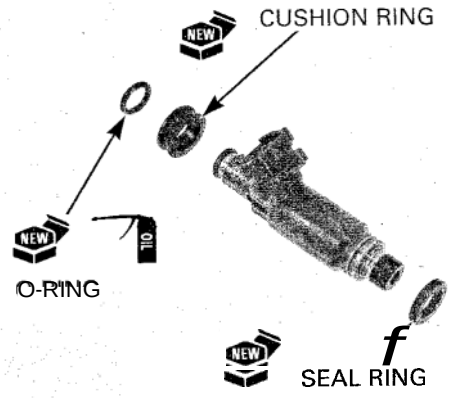
Remove the seal ring, O-ring and cushion ring.



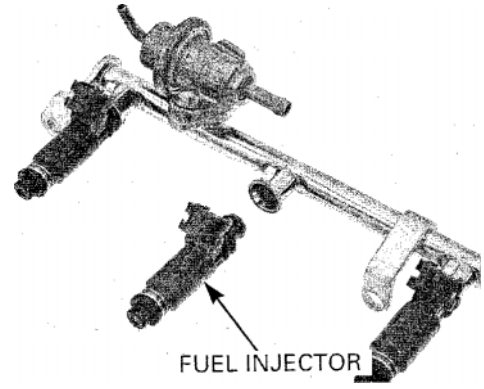
INSTALLATION

Replace the seal ring, cushion ring and O-ring with new ones as a set

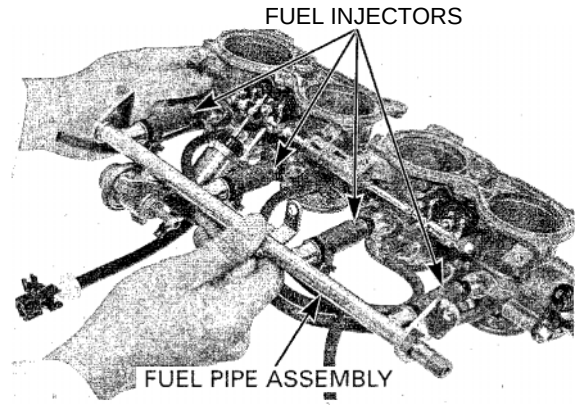
Apply oil to the new O-ring.
Install the new seal ring, cushion ring and O-ring, being careful not to damage the O-ring.



Install the fuel injectors into the fuel pipe, being careful not to damage the O-ring and cushion ring.



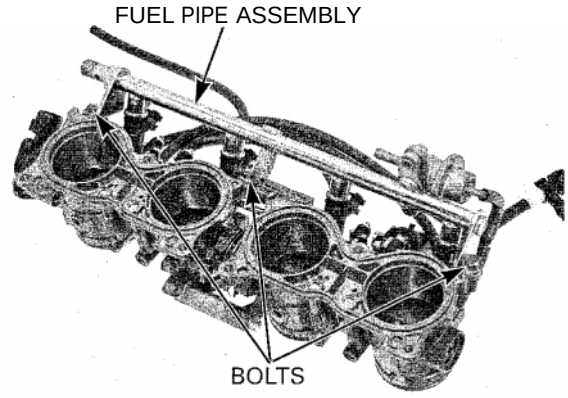
Install the fuel pipe assembly onto the throttle body, being careful not to damage the seal rings.



Install and tighten the fuel pipe mounting bolts to the specified torque.

TORQUE: 10 N•m (1.0 kgf•m, 7 lbf•ft)

Install the throttle body (page 5-71).



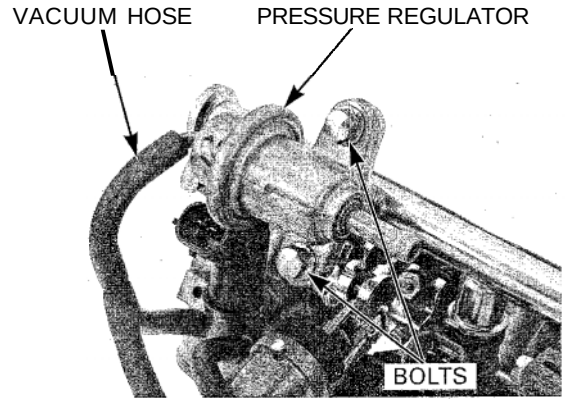
PRESSURE REGULATOR

REMOVAL/INSTALLATION

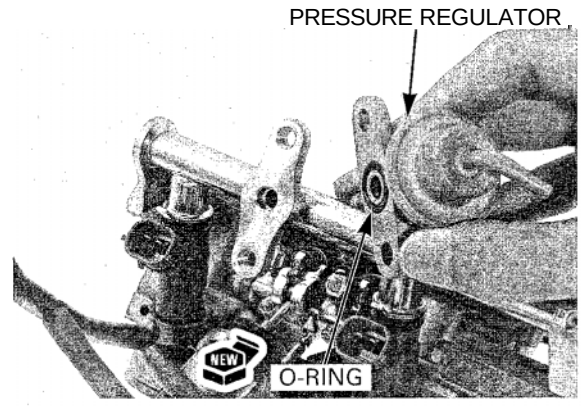
NOTICE

Do not apply excessive force to the fuel pipe.

Disconnect the vacuum hose from the pressure regulator.
Hold the fuel pipe securely, remove the pressure regulator mounting bolts, then remove the pressure regulator.



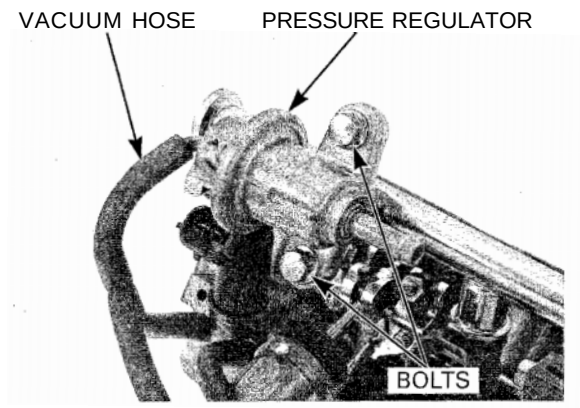
Install a new O-ring into the pressure regulator body.
Install the pressure regulator onto the fuel pipe.



Hold the fuel pipe securely, tighten the pressure regulator mounting bolts to the specified torque.

TORQUE: 10 N•m (1.0 kgf•m, 7 lbf•ft)

Connect the vacuum hose to the pressure regulator

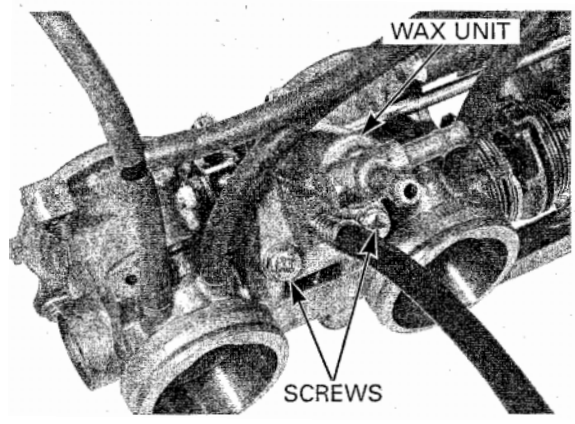


FAST IDLE WAX UNIT

Do not ioosen or remove the wax unit shaft lock nut and adjusting nut

REMOVAL

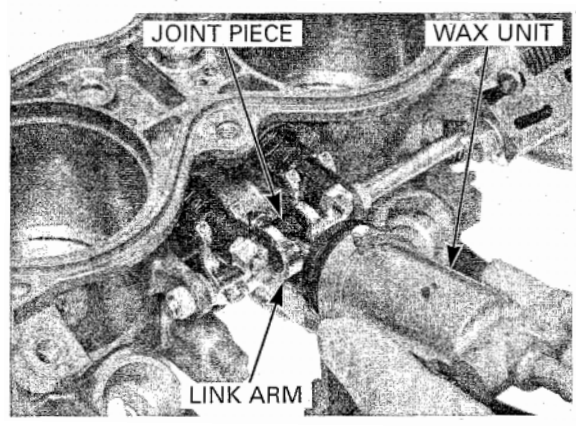
Remove the wax unit mounting screws.



Release the wax unit shaft joint piece from the wax unit link arm, then remove the wax unit assembly.

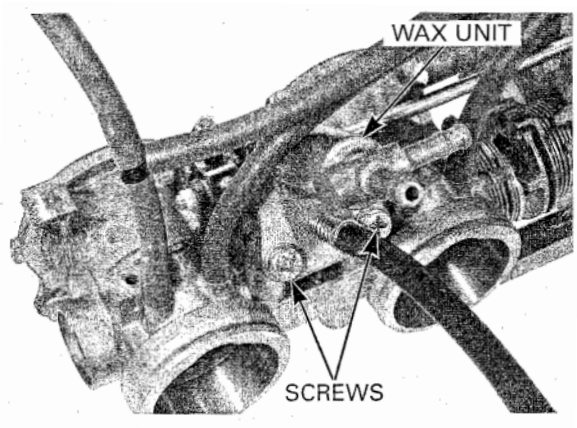
INSTALLATION

Install the wax unit shaft joint piece to the wax unit link arm.



Install and tighten the wax unit mounting screws to the specified torque.

TORQUE: 5 N•m (0.5 kgf•m, 3.6 lbf•ft)

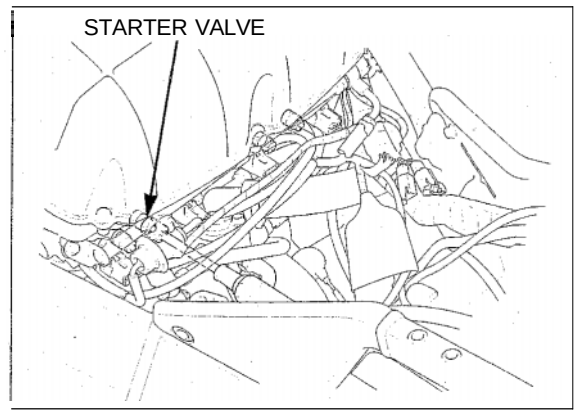


STARTER VALVE

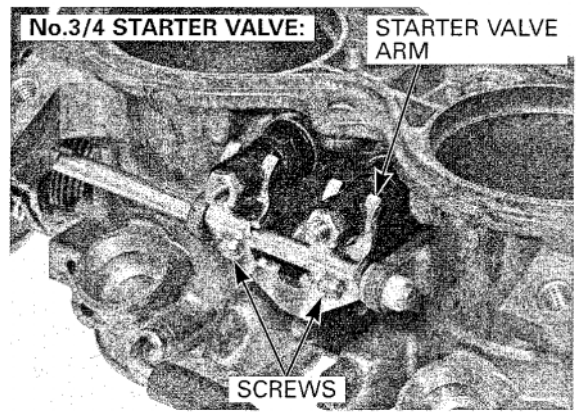
DISASSEMBLY

Turn each starter valve adjusting screw in, counting the number of turns until it seats lightly.
Record the number of turns.

Remove the fuel pipe and injectors (page 5-72).

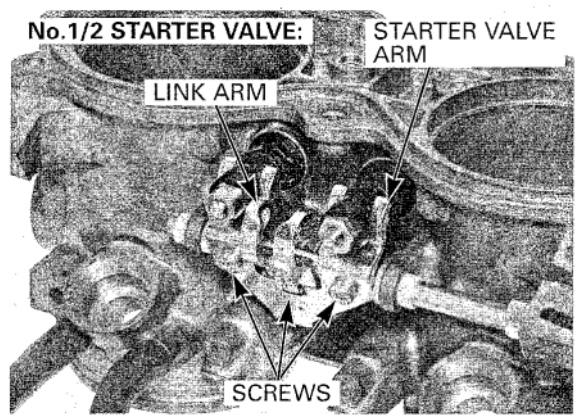


No.3/4 starter valve:
Remove the starter valve arm screws and starter valve arm.

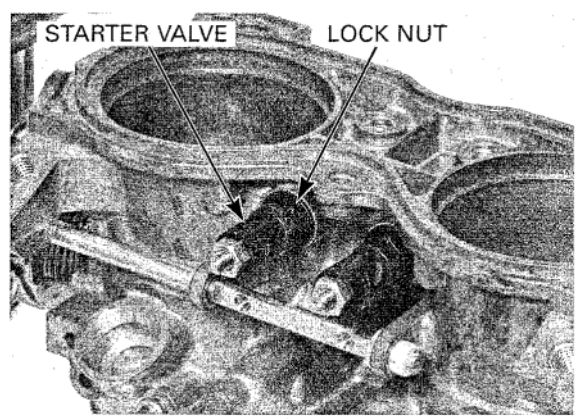


No.1/2 starter valve:
Remove the fast idle wax unit (page 5-75).

Remove the starter valve arm screws and starter valve arms.
Remove the screw and fast idle wax unit link arm.

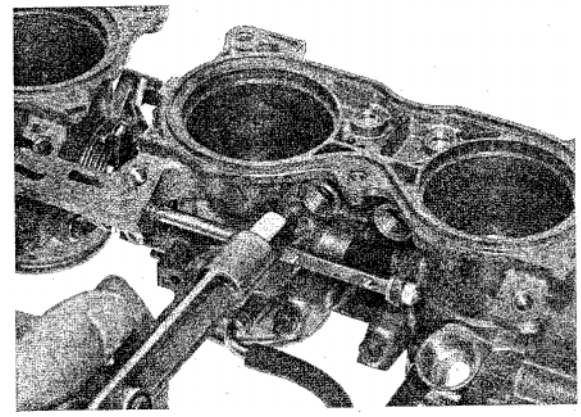


Loosen the lock nut and remove the starter valve assembly.

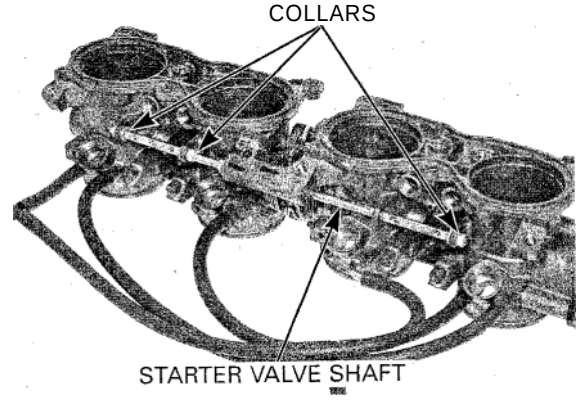


Do not apply commercially available carburetor cleaners to the inside of the throttle bore, which is coated with molybdenum

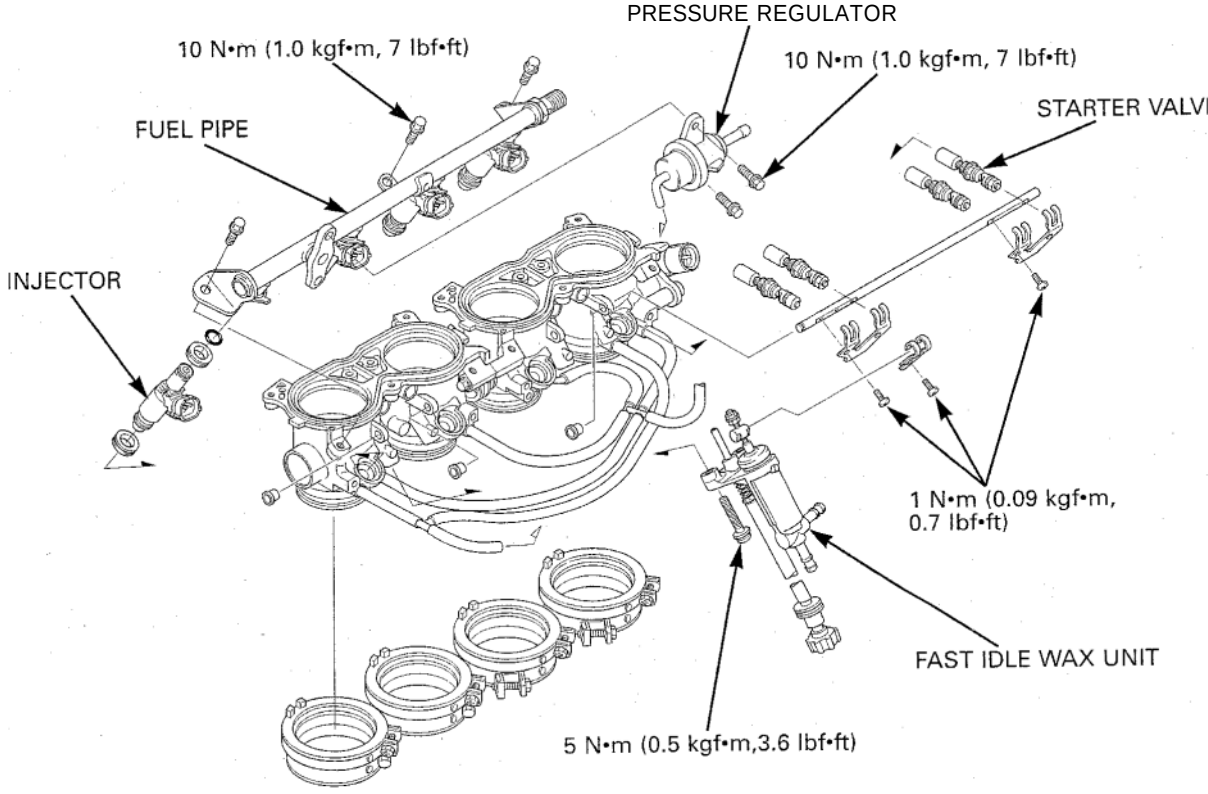
Clean the starter valve bypass using compressed air.



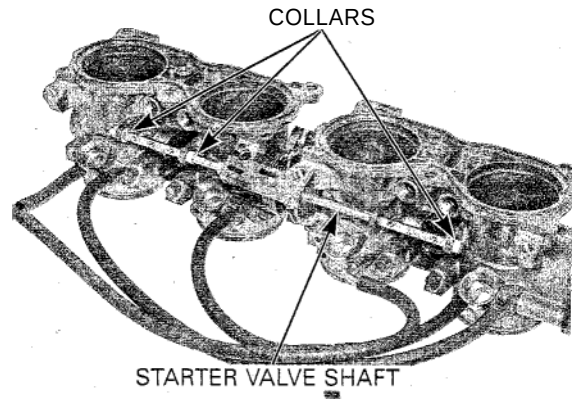
Remove the starter valve shaft and three' collars.



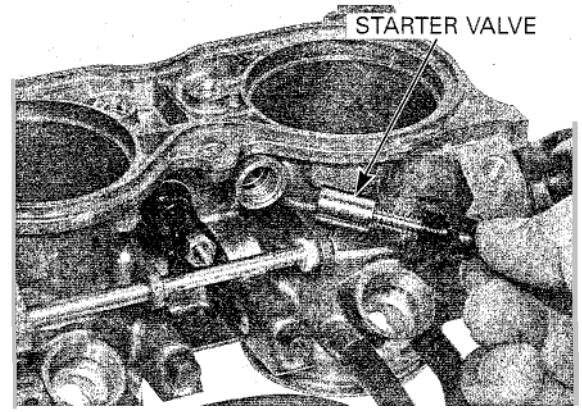
ASSEMBLY



Install the three collars and starter valve shaft.

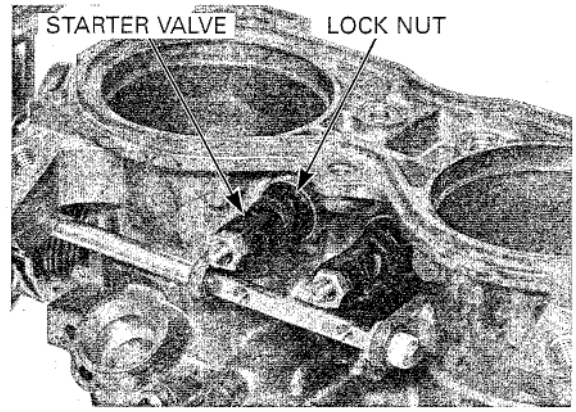


Install the starter valve assembly into the valve hole



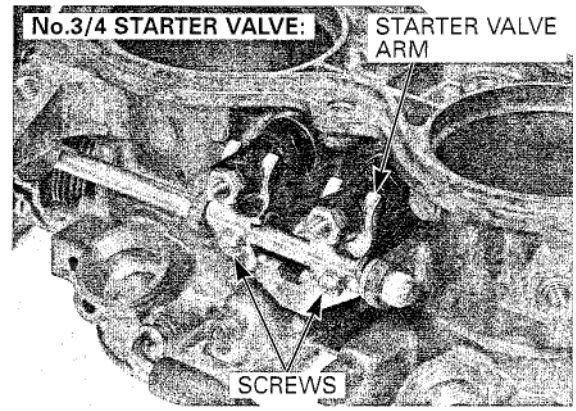
Tighten the starter valve lock nut to the specified torque.

TORQUE: 2 N•m (0.18 kgf•m, 1.3 lbf•ft)



No.3/4 starter valve:
Compress the thrust spring and install the No.3/4 starter valve arm onto the starter valves.
Install and tighten the starter valve arm mounting screws to the specified torque.

TORQUE: 1 N•m (0.09 kgf•m, 0.7 lbf•ft)



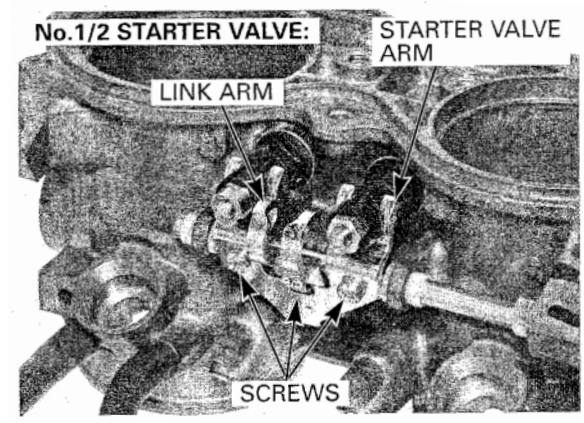
No.1/2 starter valve:
Install the No.1/2 starter valve arm to the starter valves.
Install and tighten the starter valve arm mounting screws to the specified torque.

TORQUE: 1 N•m (0.09 kgf•m, 0.7 lbf•ft)

Install the fast idle wax unit link arm and tighten the screw to the specified torque.

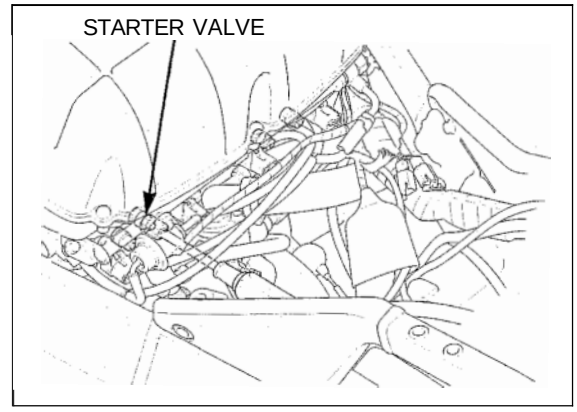
TORQUE: 1 N•m (0.09 kgf•m, 0.7 lbf•ft)

Install the fast idle wax unit (page 5-75).



Turn the starter valve screw until it seats lightly, then back it out as noted during removal.

Install the throttle body (page 5-71).

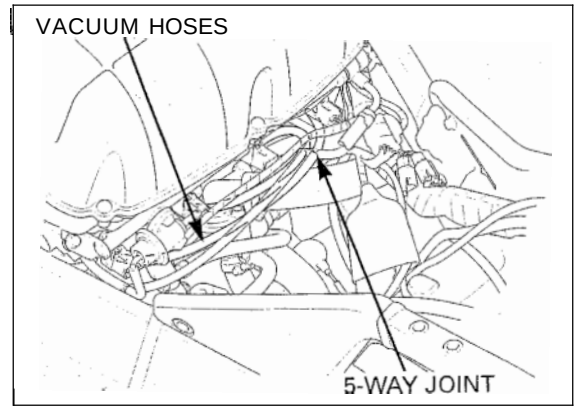


STARTER VALVE SYNCHRONIZATION

- Synchronize the starter valve with the engine at the normal operating temperature and with the transmission in neutral.
- Use a tachometer with graduations of 50 rpm or smaller that will accurately indicate 50 rpm change.

Open and support the front end of the fuel tank (page 3-4).

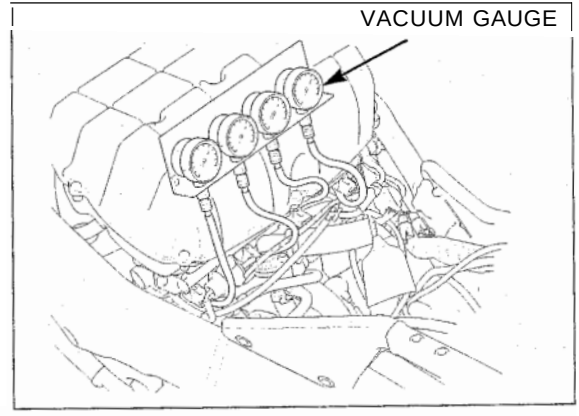
Disconnect the each cylinder vacuum hose from the 5-way joint.



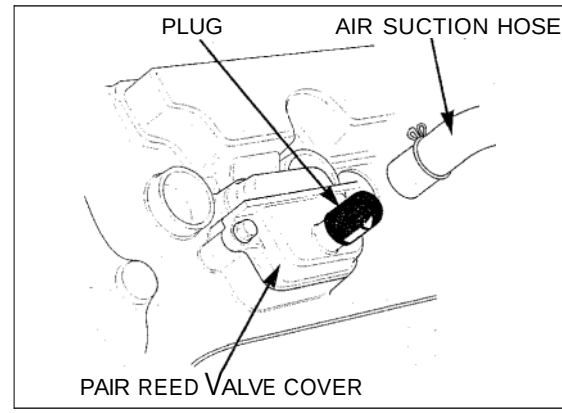
Connect the vacuum gauge adaptors to the vacuum joints, then connect the hoses to the vacuum gauge.

TOOL:
Vacuum gauge set **07LMJ–001000A**

Connect the tachometer.

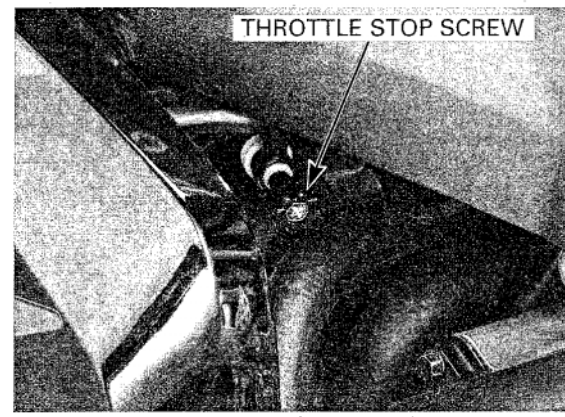


Disconnect the PAIR air suction hoses from the reed valve covers and plug the cover.



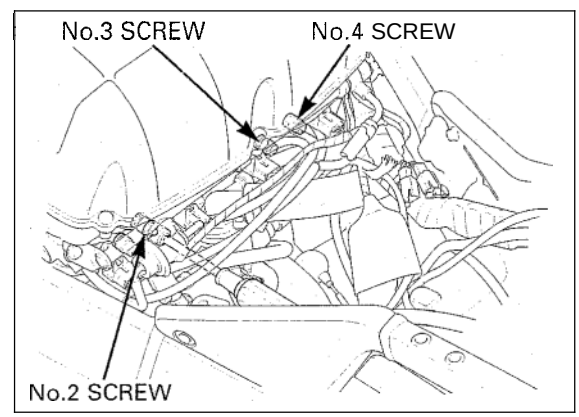
Start the engine and adjust the idle speed.

IDLE SPEED: 1,200 ± 100 rpm

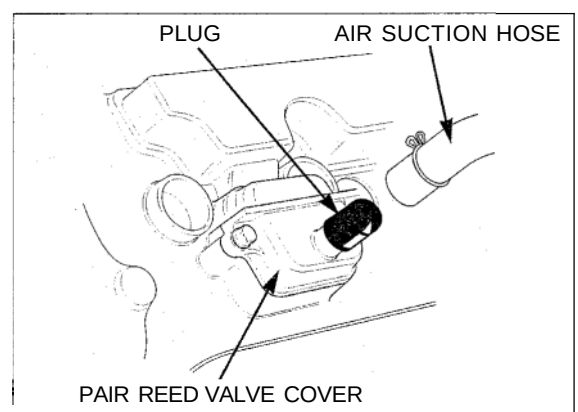


The No 1 starter valve cannot be adjusted, it is the base starter valve

Adjust each intake vacuum pressure with the No.1 cylinder.

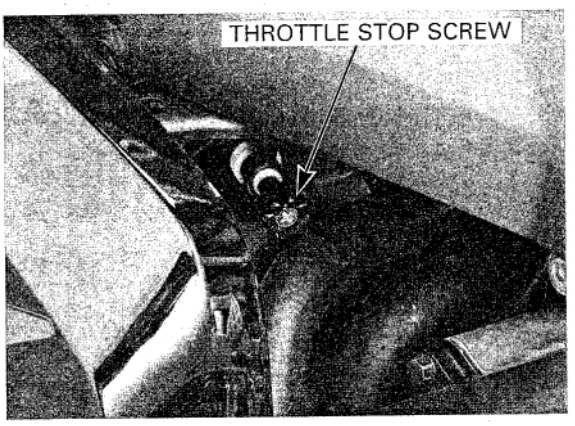


Remove the plugs and connect the PAIR air suction hoses to the reed valve covers.



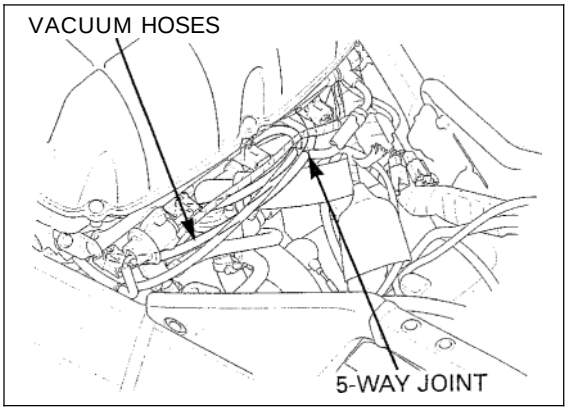
Adjust the idle speed if the idle speed differs from the specified speed.

IDLE SPEED: 1,200 ± 100 rpm



Remove the vacuum gauge from the vacuum hoses. Connect the each cylinder vacuum hose to the 5-way joint.

Reset the PGM-FI self-diagnosis system (page 5-7).



MAP SENSOR

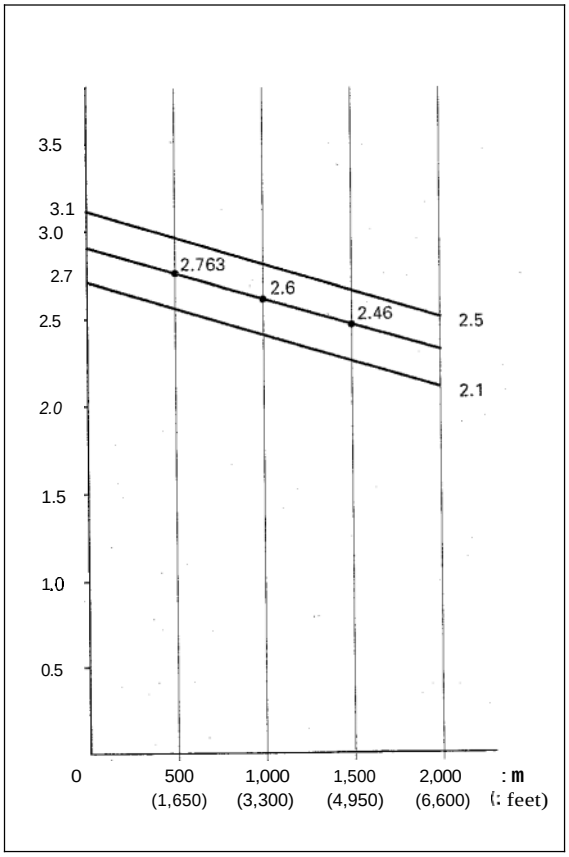
OUTPUT VOLTAGE INSPECTION

Connect the test harness to the ECM (page 5-8).

Measure the voltage at the test harness terminals (page 5-9).

CONNECTION: B4 (+) **– A26** (–)
STANDARD: 2.7 – 3.1 V

The MAP sensor output voltage (above) is measured under the standard atmosphere (1 atm = 1,030 hPa).
The MAP sensor output voltage is affected by the distance above sea level, because the output voltage is changed by atmosphere.
Check the sea level measurement and be sure that the measured voltage falls within the specified value.

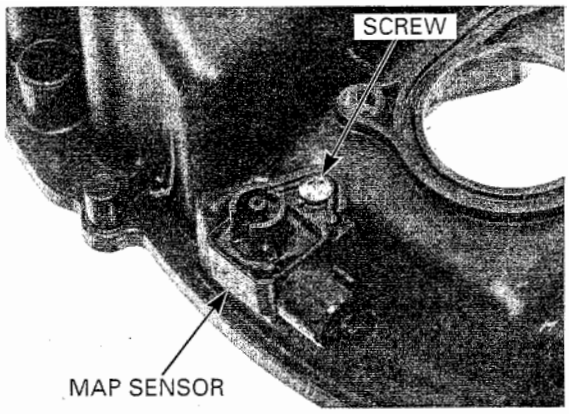


MAP SENSOR REMOVAL/INSTALLATION

Remove the air cleaner housing (page 5-64).

Remove the screw and MAP sensor from the air cleaner housing.

Installation is in the reverse order of removal.



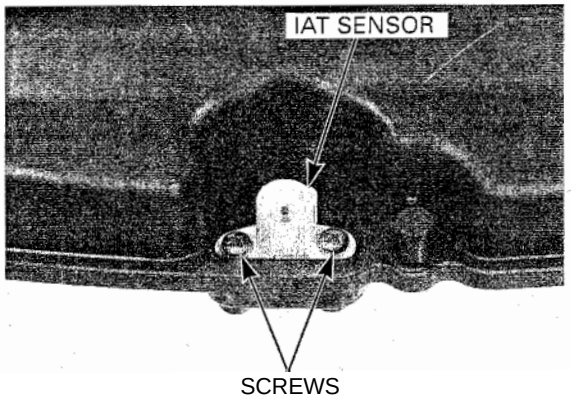
IAT SENSOR

REMOVAL/INSTALLATION

Remove the air cleaner housing (page 5-64).

Remove the screws and IAT sensor from the air cleaner housing cover.

Installation is in the reverse order of removal.



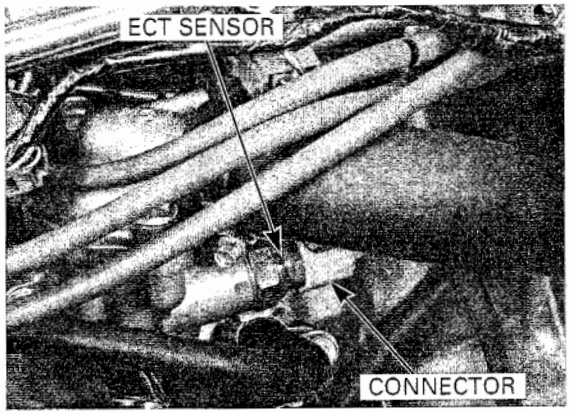
ECT SENSOR

Replace the ECT sensor while the engine is cold

REMOVAL/INSTALLATION

Drain the coolant from the system (page 6-4).
Open and support the front end of the fuel tank (page 3-4).

Disconnect the ECT sensor connector from the sensor.
Remove the ECT sensor and sealing washer.



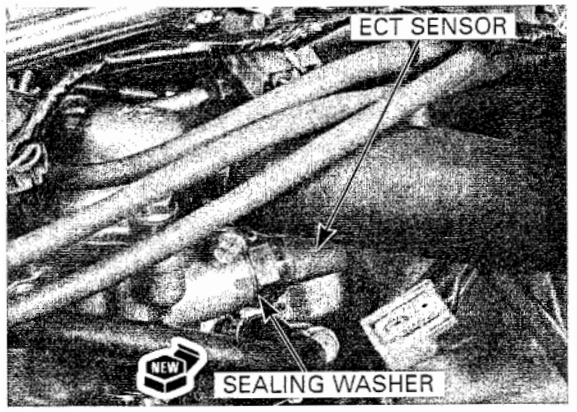
Always replace a sealing washer with a new one

Install the new sealing washer and ECT sensor.
Tighten the ECT sensor to the specified torque.

TORQUE: 23 N•m (2.3 kgf•m, 17 lbf•ft)

Connect the ECT sensor connector.

Fill the cooling system with recommended coolant (page 6-5).

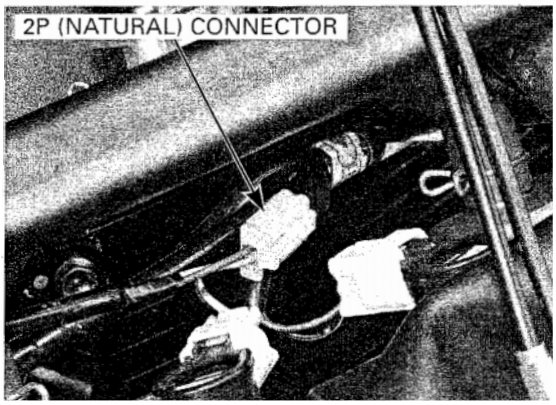


CAM PULSE GENERATOR

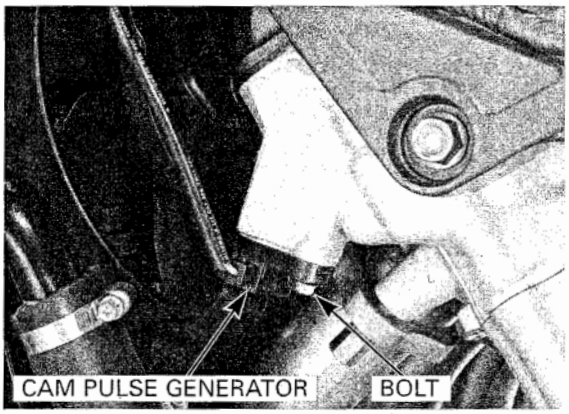
REMOVAL/INSTALLATION

Remove the air cleaner housing (page 5-64).

Disconnect the cam pulse generator 2P (Natural) connector.

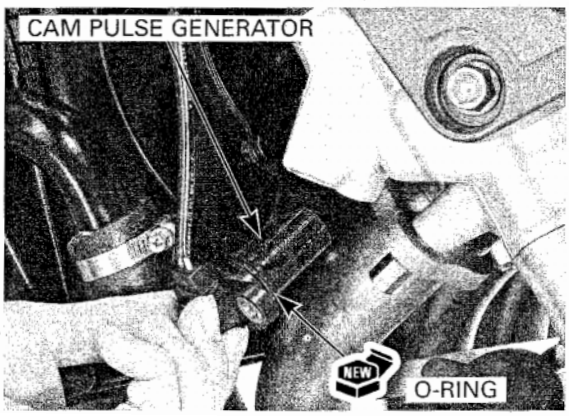


Remove the bolt and cam pulse generator from the cylinder head.



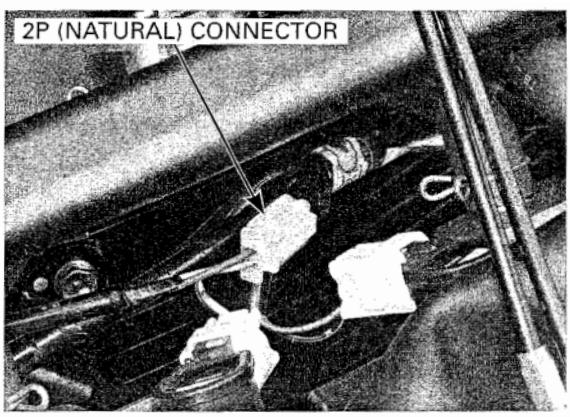
Install the new O-ring onto the cam pulse generator.
Install the cam pulse generator into the cylinder head.

Install and tighten the mounting bolt securely.



Route the cam pulse generator wire properly, connect the 2P (Natural) connector.

Install the removed parts in the reverse order of removal.



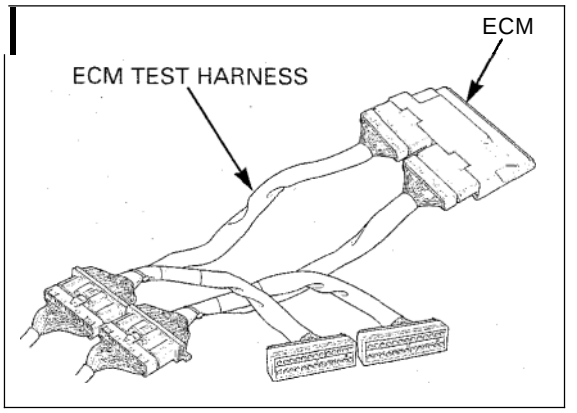
TP SENSOR

INSPECTION

Remove the ECM cover (page 5-87).

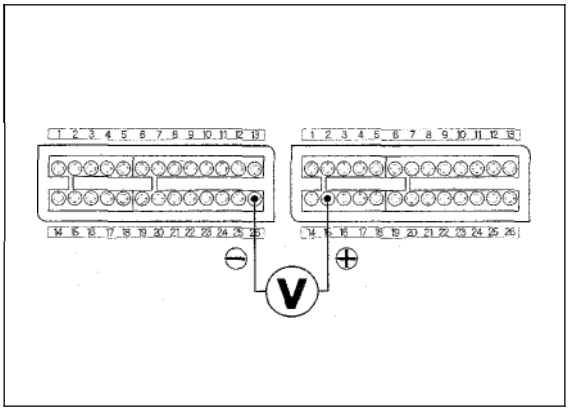
Disconnect the ECM 26P (Black) and 26P (Light gray) connectors.
Check the connector for loose or corroded terminals.
Connect the ECM test harness between the ECM and main wire harness.

TOOL:
ECM test harness, 26P **070MZ–0010100**
(two required)



1. INPUT VOLTAGE INSPECTION
Turn the ignition switch to "ON" and measure and record the input voltage at the test harness terminals using a digital multimeter.

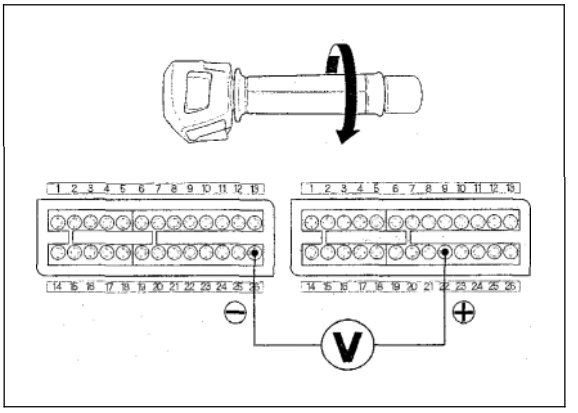
CONNECTION:
B15 (+) **– A26** (–)
Standard: 4.5 – 5.5V



If the measurement is out of specification, check the following:
– Loose connection of the ECM multi-connector
– Open circuit in wire harness

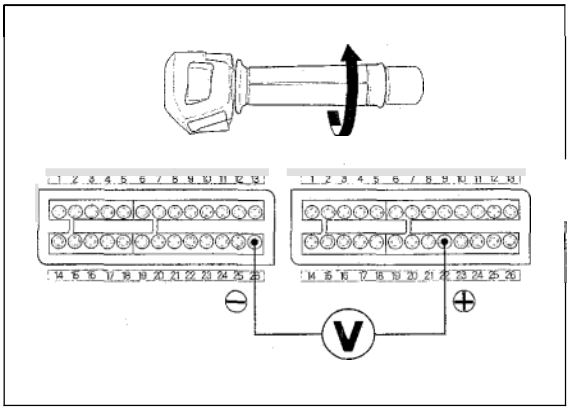
2. OUTPUT VOLTAGE INSPECTION WITH THROTTLE FULLY OPEN
Turn the ignition switch to "ON" and measure and record the output voltage at the test harness terminals.

CONNECTION:
B22 (+) **– A26** (–)
MEASURING CONDITION:
At throttle fully open



3. OUTPUT VOLTAGE INSPECTION WITH THROTTLE FULLY CLOSED
Turn the ignition switch to **"ON"** and measure and record the output voltage with the throttle fully closed.

CONNECTION:
B22 (+) **– A26** (–)
MEASURING CONDITION:
At throttle fully closed



4. CALCULATE RESULT COMPARISON
Compare the measurement to the result of the following calculation.

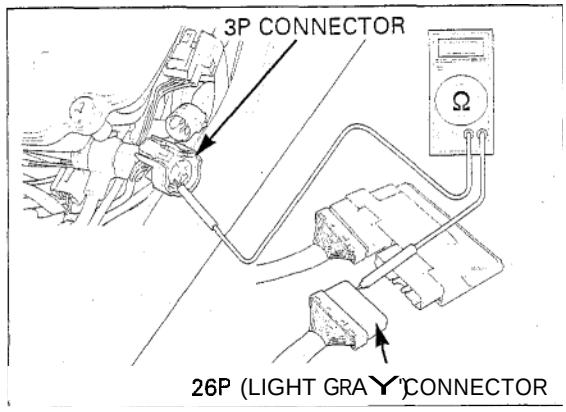
With the throttle fully open:
Measured input voltage X 0.824 □ Vo

The sensor is normal if the measurement output voltage measured in step 2 is within 10% of Vo.

With the throttle fully closed:
Measured input voltage X 0.1 = Vc

The sensor is normal if the throttle closed output voltage measured in step 3 is within 10% of Vc.

Using an analog meter, check that the needle of the voltmeter swings slowly when the throttle is opened gradually.



CONTINUITY INSPECTION
Open and support the front end of the fuel tank (page 3-4).

Disconnect the ECM 26P (Light gray) connector and the TP sensor 3P connector.
Check for continuity between the ECM and TP sensor.

If there is no continuity, check the open or short circuit in wire harness.

BANK ANGLE SENSOR

INSPECTION

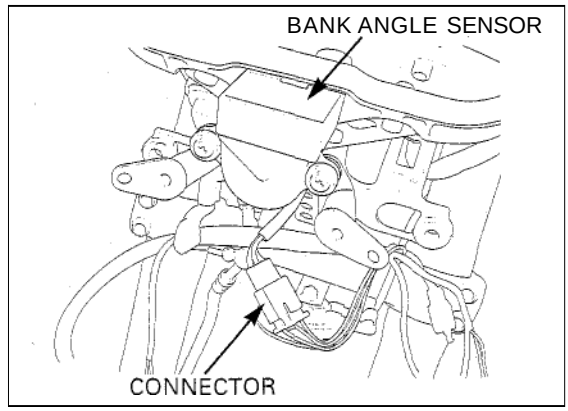
Support the motorcycle level surface.
Open and support the front end of the fuel tank (page 3-4).

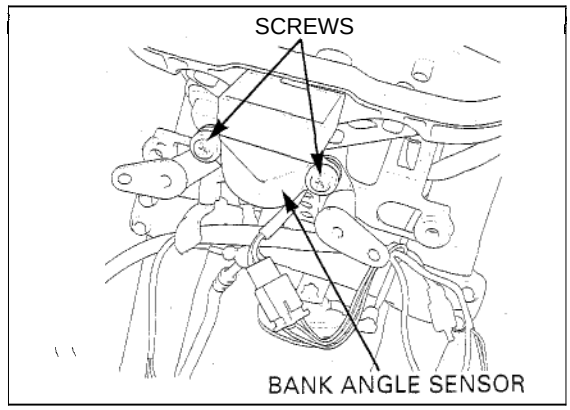
Do not disconnect the bank angle sensor connector during inspection

Turn the ignition switch to "ON" and measure the voltage between the following terminals of the bank angle sensor connector with the connector connected.

TERMINAL	STANDARD
White (+) – Green (–)	Battery voltage
Red/White (+) – Green (–)	0 – 1 v

Turn the ignition switch to "OFF".
Remove the screws and bank angle sensor.



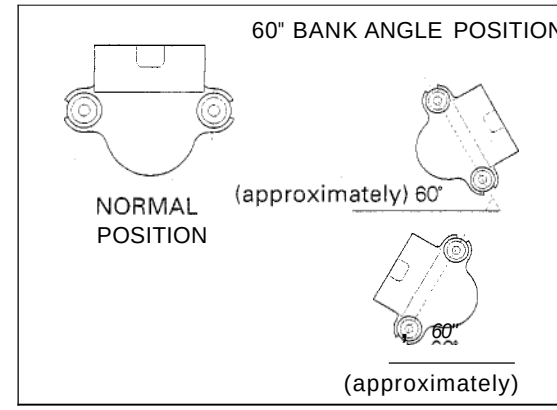


Connect the bank angle sensor 3P (Green) connector and place the bank angle sensor horizontal as shown, and ignition switch to "ON".

The bank angle sensor is normal if the engine stop relay clicks and power supply is closed.

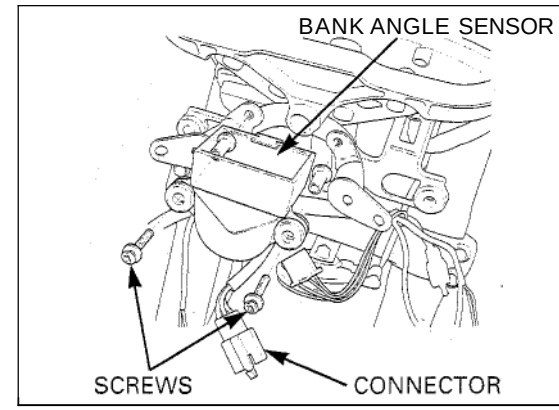
Incline the bank angle sensor approximately 60 degrees to the left or right with the ignition switch turned to "ON".
The bank angle sensor is normal if the engine slop relay clicks and power supply is open.

If you repeat this test, first turn the ignition switch-to "OFF", then turn the ignition switch to "ON".



REMOVAL/INSTALLATION

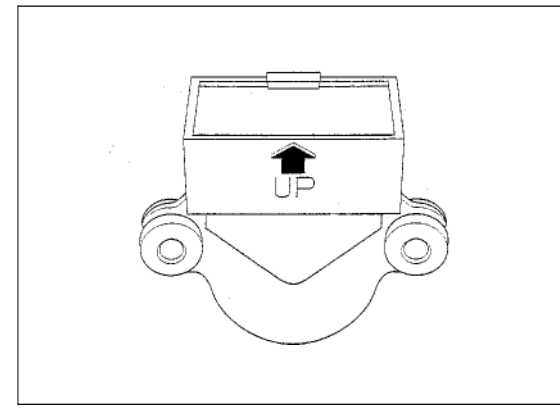
Disconnect the bank angle sensor 3P (Green) connector.
Remove the two screws, nuts and bank angle sensor.



install the bank angle sensor with its "UP" mark facing up

Installation is in the reverse order of removal.

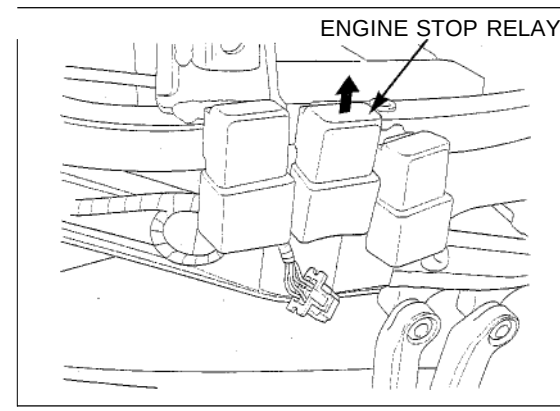
Tighten the mounting screws securely.



ENGINE STOP RELAY

INSPECTION

Disconnect the engine stop relay 4P connector, remove the engine stop relay.



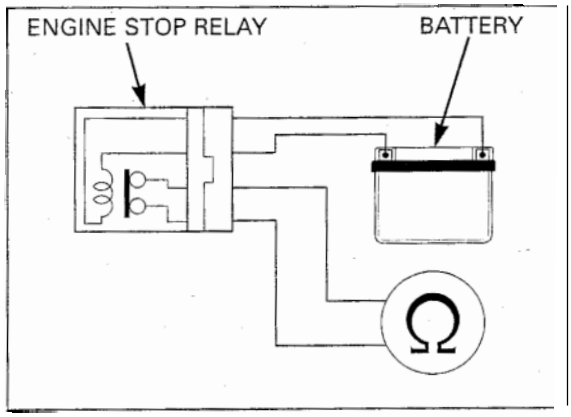
Connect the ohmmeter to the engine stop relay connector terminals.

CONNECTION: Red/White – Black/White

Connect the 12 V battery to the following engine stop relay connector terminals.

CONNECTION: Red/Orange – Black

There should be continuity only when the 12 V battery is connected.
If there is no continuity when the 12 V battery is connected, replace the engine stop relay.

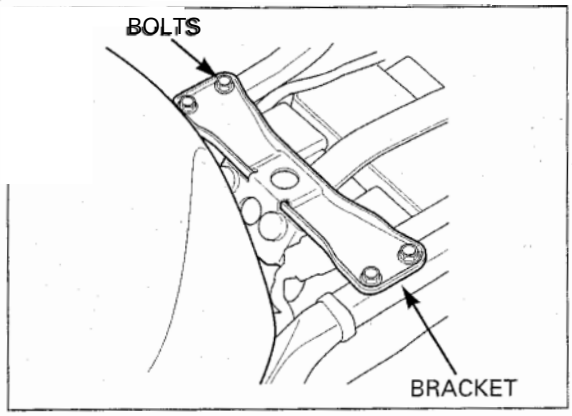


ECM (ENGINE CONTROL MODULE)

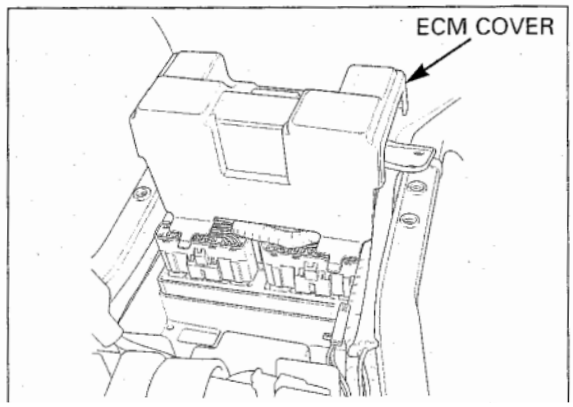
REMOVAL/INSTALLATION

Remove the seat (page 2-2).
Remove the fuel tank rear bracket bolts and pull up the bracket.

Remove the battery (page 16-4).

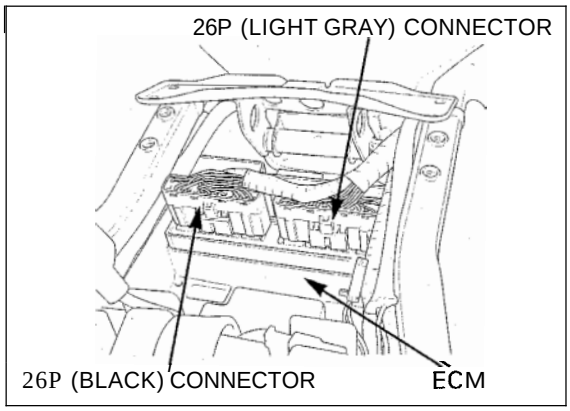


Remove the ECM cover.



Disconnect the ECM 26P (Black) and 26P (Light gray) connectors, then remove the ECM.

Installation is in the reverse order of removal.



POWER/GROUND LINE INSPECTION

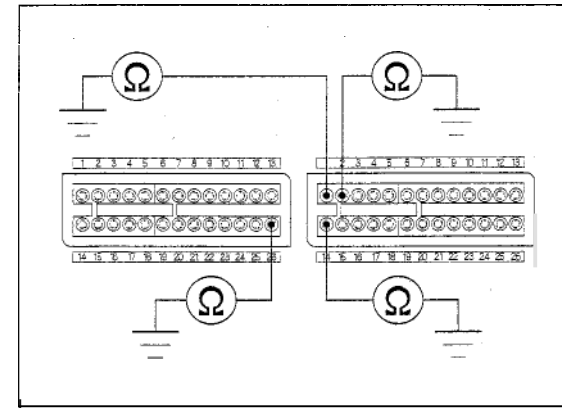
Connect the test harness between the main wire harness and ECM (page 5-8).

TOOL:

ECM test harness, 26P	**070MZ-0010100 (two required)**

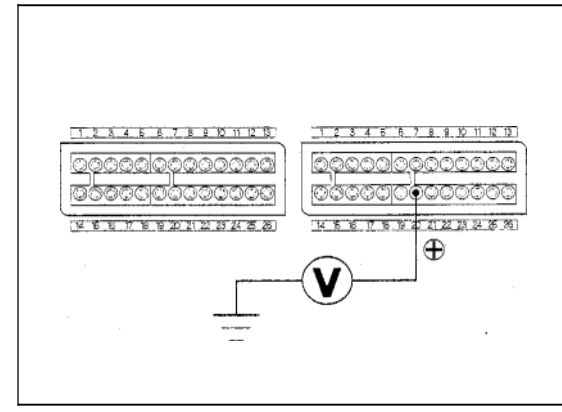
GROUND LINE

Check for continuity between the ECM test harness connector B1 terminal and ground, between the B14 terminal and ground, between the A26 terminal and ground, and between the B2 terminal and ground.
There should be continuity at all times.
If there is no continuity, check for an open circuit in the Green/Pink wire and Green wire.



POWER INPUT LINE

Turn the ignition switch to "ON" with the engine stop switch in the " ❍ " position.
Measure the voltage between the ECM test harness connector B20 terminal (+) and ground.
There should be battery voltage.
If there is no voltage, check for open circuit in Black/White wire between the ECM and bank angle sensor/relay.
If the wire is OK, check for the bank angle sensor/engine stop relay (page 5-85, 86).

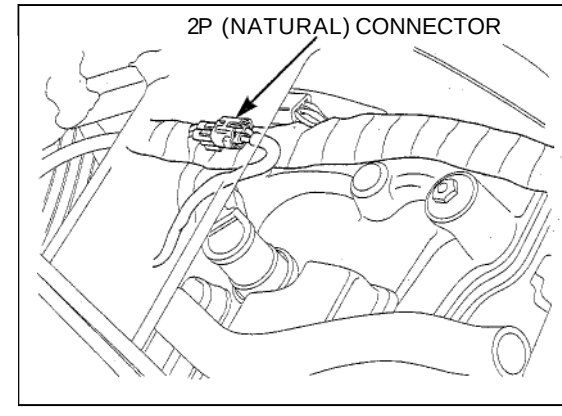


PAIR SOLENOID VALVE

REMOVAL/INSTALLATION

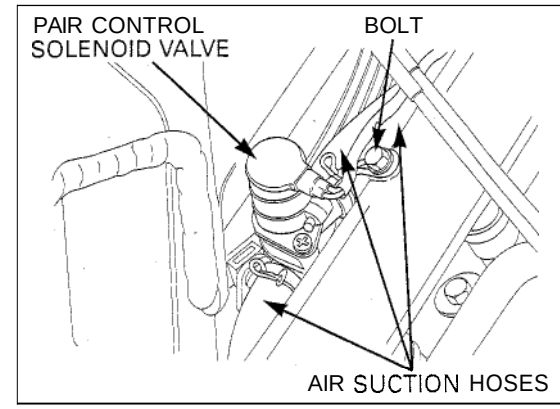
Remove the air cleaner housing (page 5-64).

Disconnect the PAIR solenoid valve 2P (Natural) connector.



Disconnect the PAIR air suction hoses.
Remove the bolt and PAIR solenoid valve.

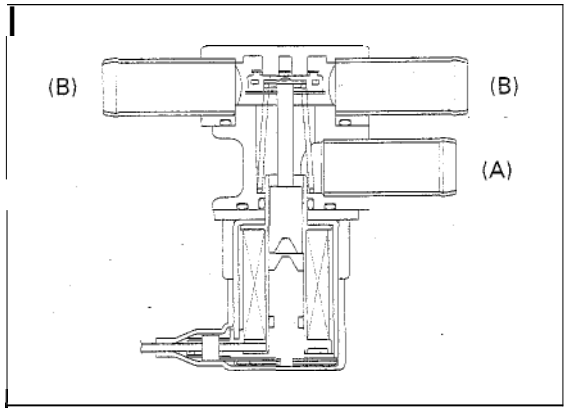
Installation is in the reverse order of removal.



INSPECTION

Remove the PAIR solenoid valve.

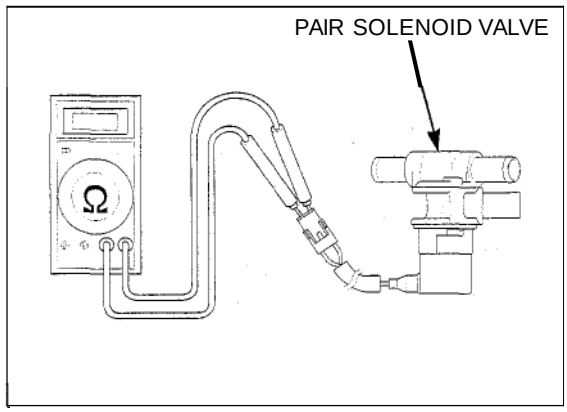
Check that the air should not flow (A) to (B), only when the 12 V battery is connected to the PAIR solenoid valve terminals.



Check the resistance between the terminals of the PAIR solenoid valve.

STANDARD: 20 – 24 Ω (20 °C/68 °F)

If the resistance is out of specification, replace the PAIR solenoid valve.



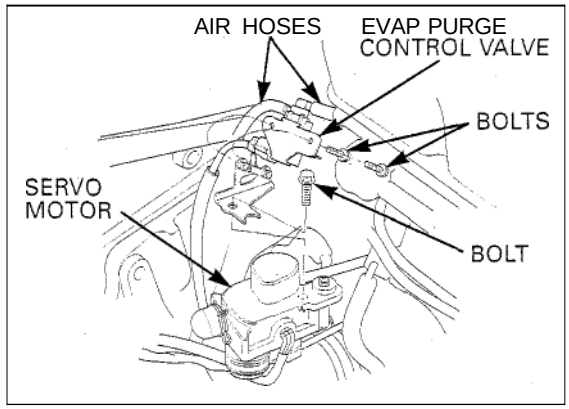
EVAP PURGE CONTROL SOLENOID VALVE (California type only)

REMOVAL/INSTALLATION

Remove the fuel tank (page 5-59).

Remove the bolt, then remove the EGCV/air intake valve servo motor and bracket from the frame.

Disconnect the EVAP purge control valve 2P connector. Disconnect the air hoses from the EVAP purge control valve.

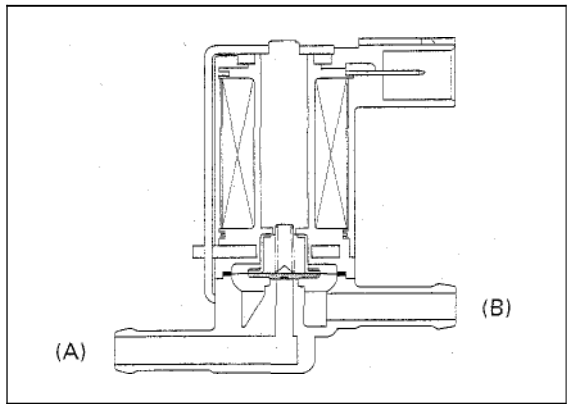


Installation is in the reverse order of removal

INSPECTION

Remove the EVAP purge control valve.

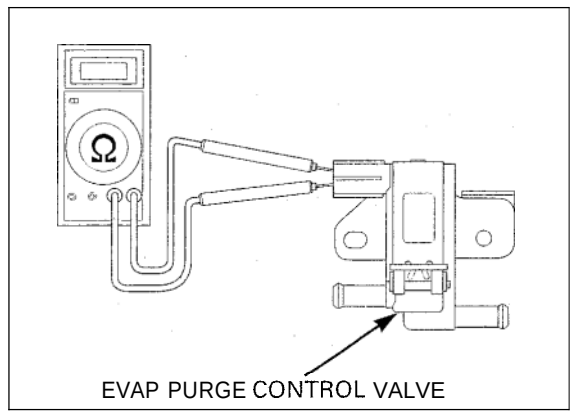
Check that the air should not flow (A) to (B), only when the 12 V battery is connected to the EVAP purge control valve terminals.



Check the resistance between the terminals of the EVAP purge control valve.

STANDARD: 30 – 40 kΩ (20°C/68°F)

If the resistance is out of specification, replace the EVAP purge control valve.



O_2 SENSOR (California type only)

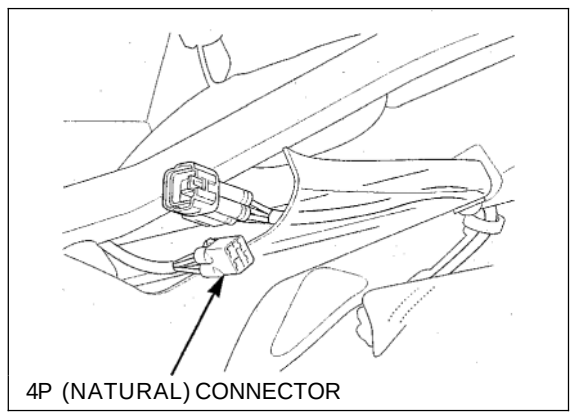
Do not service the O_2 sensor while it is hot

REMOVAL

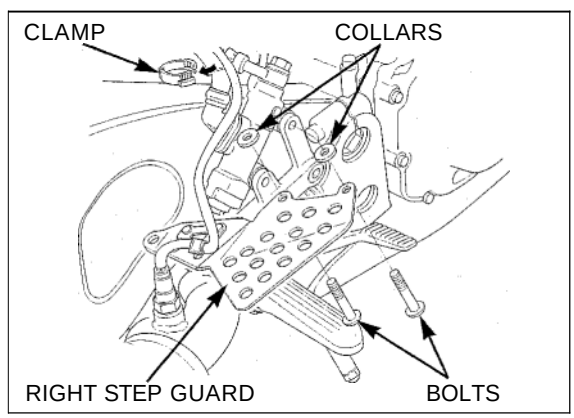
NOTE:
- Handle the O_2 sensor with care.
- Do not get grease, oil or other materials in the O_2 sensor air hole.

Remove the seat (page 2-2).

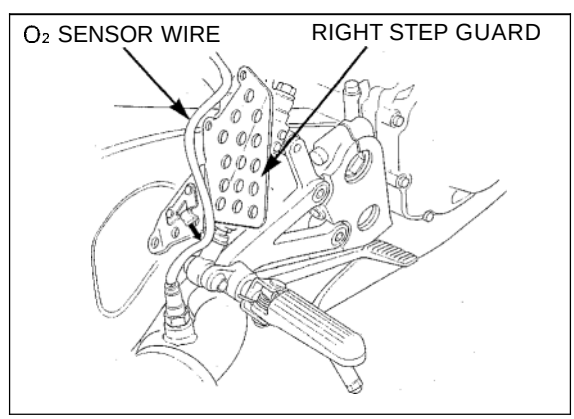
Disconnect the O_2 sensor 4P (Natural) connector.



Remove the O_2 sensor wire clamp.
Remove the right step guard mounting bolts and collars.



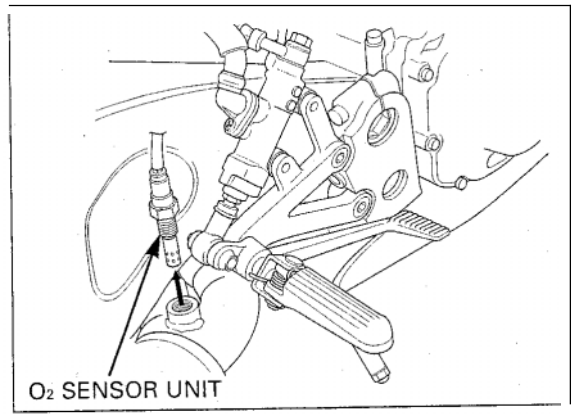
Release the O_2 sensor wire from the right step guard.



Remove the O_2 sensor unit.

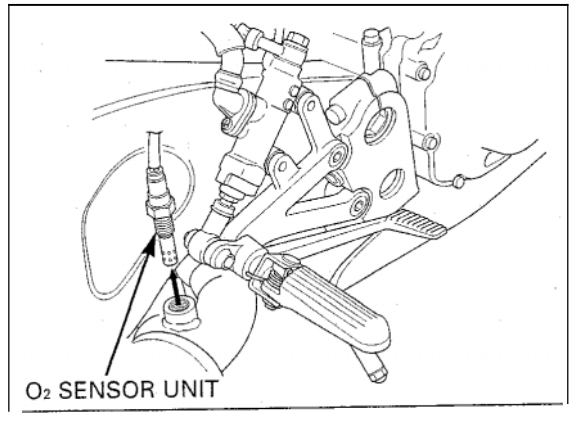
NOTICE

- *Be careful not to damage the sensor wire.*
- *Do not use an impact wrench to remove or install the O_2 sensor.*

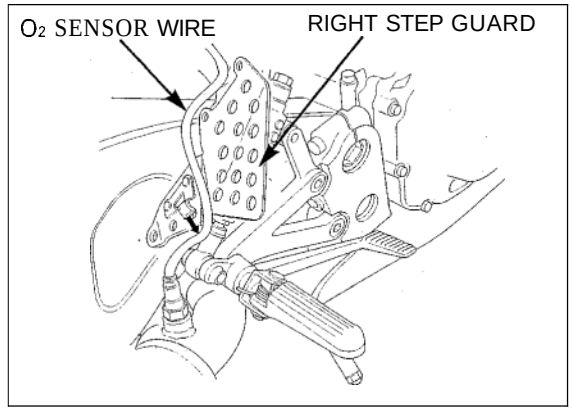


Install the O_2 sensor unit.
Tighten the unit to the specified torque.

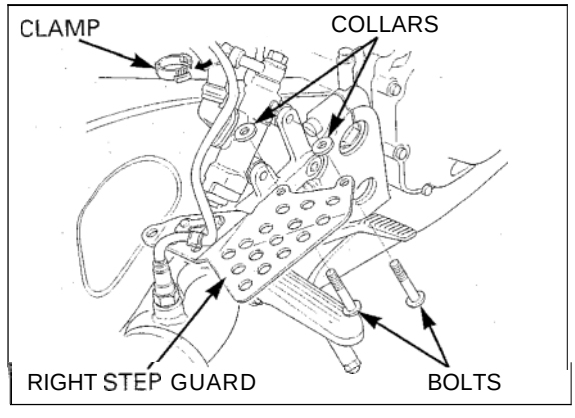
TORQUE: 25 N·m (2.6 kgf·m, 19 lbf·ft)



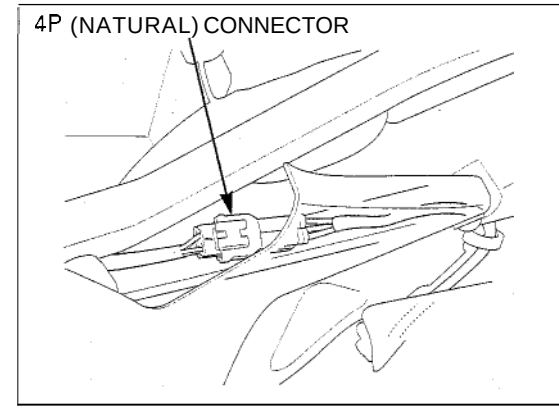
Clamp the O_2 sensor wire to the right step guard.



Install the rear master cylinder, collars and right step guard, then tighten the mounting bolts.
Clamp the O_2 sensor wire with the rear brake reservoir hose using the hose clamp.



Route the O_2 sensor wire into the frame.
Connect the O_2 sensor 4P (Natural) connector.

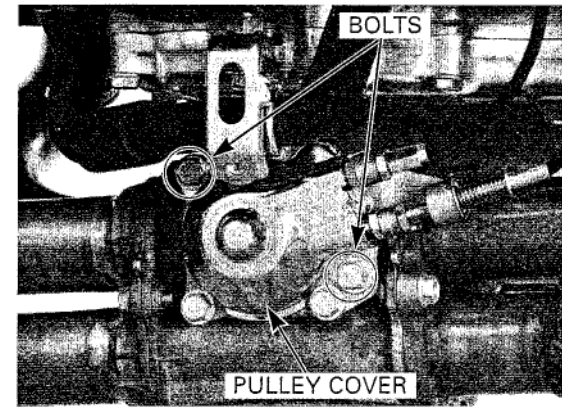


EGCV AND AIR INTAKE VALVE INSPECTION

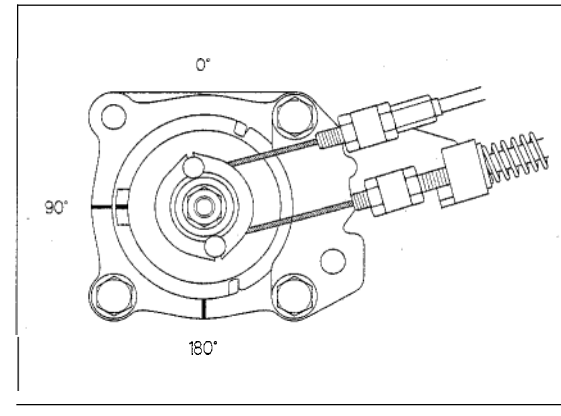
Before operating inspection, check that the PGM-FI MIL does not indicate an EGCV failure.

Remove the lower cowl (page 2-7).
Remove the air cleaner element (page 3-6).

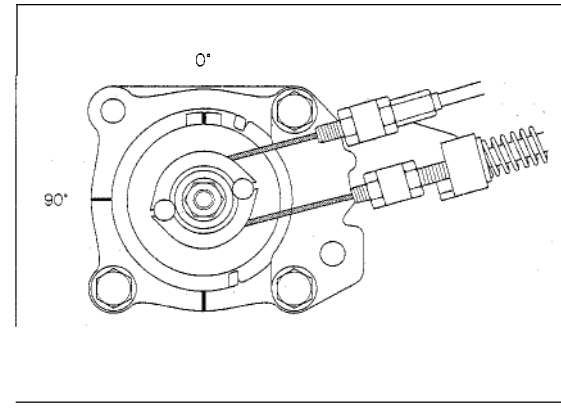
Remove the bolts and EGCV pulley cover.



Turn the ignition switch to "ON" and check for EGCV cable guide pulley position.
Make sure the pulley index line is positioned 90° (facing forward) as shown.

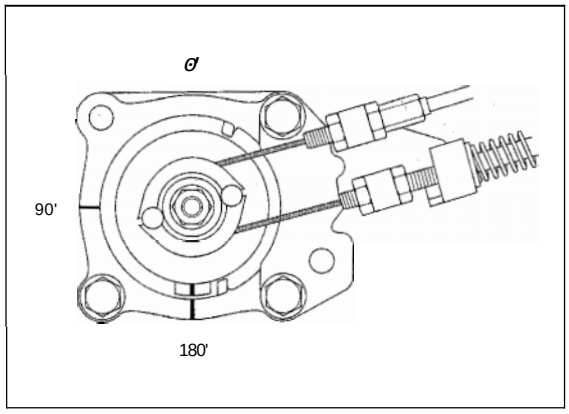


Start the engine, and warm it up to operating temperature.
Gradually increase the engine rev up.
Make sure the EGCV cable pulley is moved to 0° (pulley index line facing up) at about 3,000 rpm as shown.



Check that the EGCV cable pulley is moved to 180° (pulley index line facing down) at about 8,000 rpm.
Also check that the intake flap valve is opened at the same time.

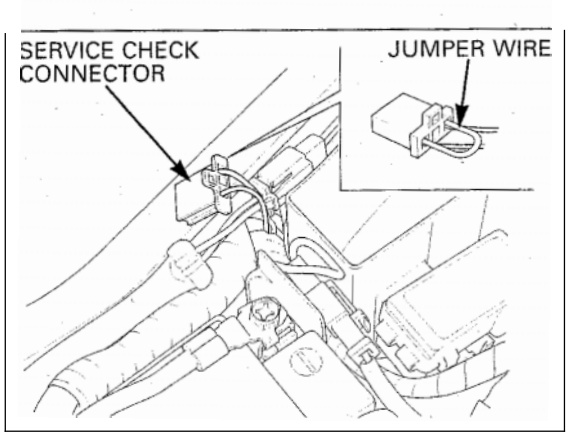
If the intake and EGCV position is incorrect, adjust the cables (see below).
If the intake and EGCV operation is incorrect, check for each related parts.



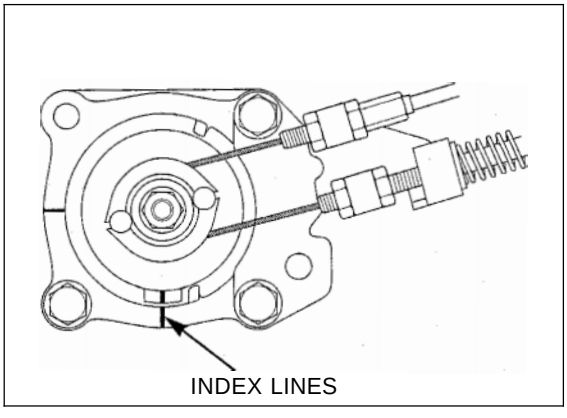
CABLE ADJUSTMENT

Remove the seat (page 2-2).

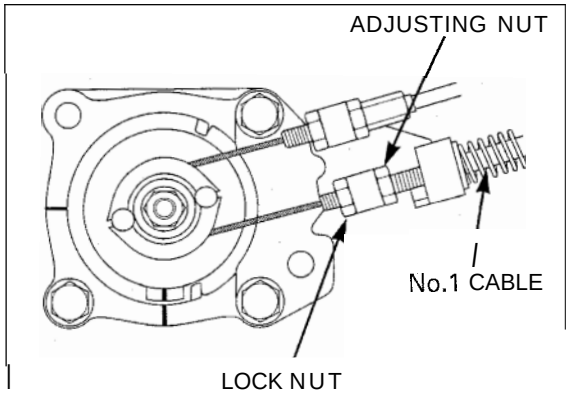
Turn the ignition switch to "ON".
Short the service check connector with a jumper wire.



EGCV CONTROL CABLE ADJUSTMENT
Make sure that the EGCV cable guide pulley index line is aligned with the EGCV cover index line.
If the index lines do not align, adjust the EGCV control cables.

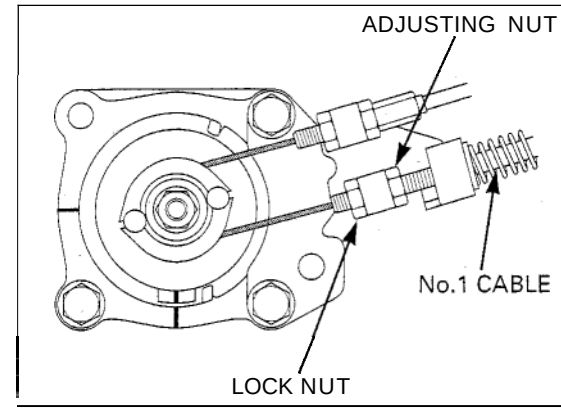


Fully loosen the No.1 adjusting cable (spring equipped cable) lock nut and adjusting nut.



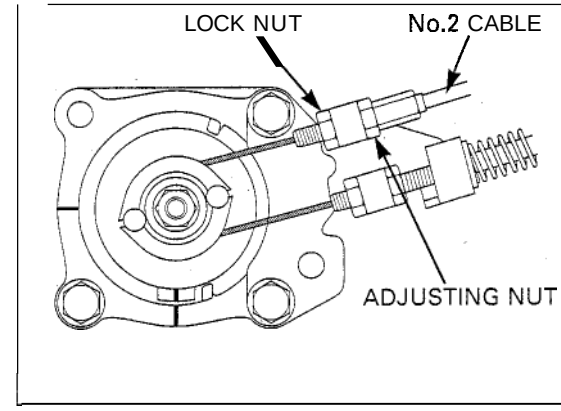
Adjust the EGCV position by loosening the No.1 adjusting cable lock nut and turning the adjusting nut.

Move the cable several times and recheck the index line.
Hold the No.1 cable adjusting nut, then tighten the lock nut securely.



Turn the No.2 cable lock nut and adjust the cable so there is no free play.
Tighten the No.2 cable lock nut securely.

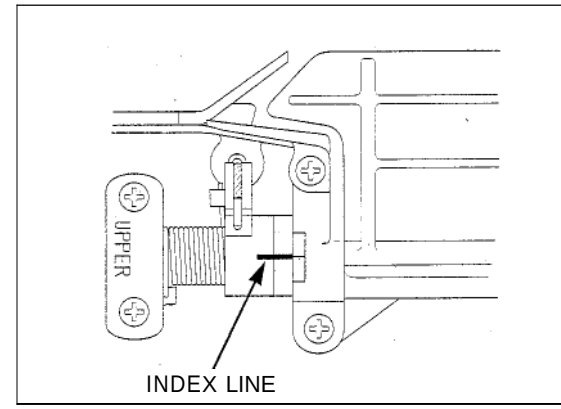
Remove the jumper wire from the service check connector.



INTAKE VALVE CONTROL CABLE ADJUSTMENT
Turn the ignition switch to "ON" and short the service check connector with a jumper wire (page 5-93).
Remove the air cleaner element (page 3-6).

Make sure the index lines between the intake valve shaft pulley and air guide are aligned.

If the index lines are not aligned adjust as follows.

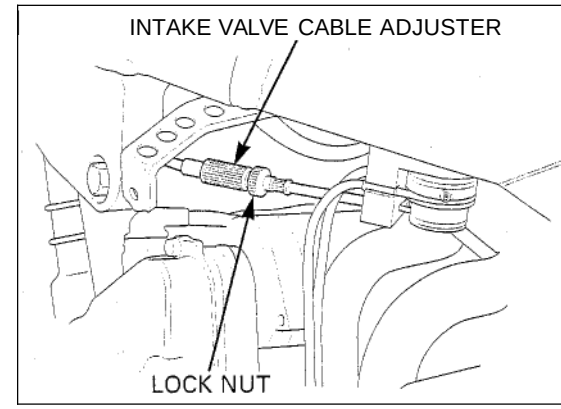


Loosen the intake valve cable adjuster lock nut.

Turn the intake valve cable adjuster, align the intake valve cable guide pulley index line with the index line on the valve shaft.

At this point, turn back the cable adjuster 1/2 turn.
Tighten the lock nut securely.

Remove the jumper wire from the service check connector.

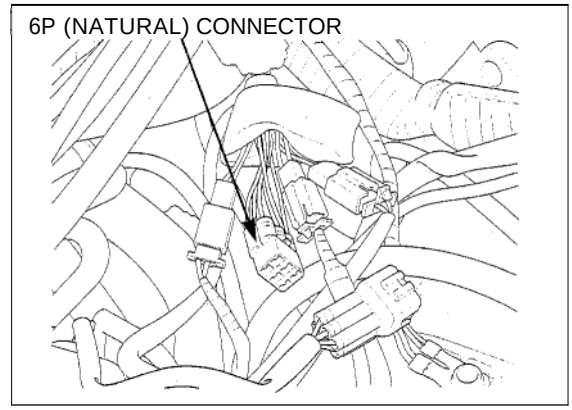


EGCV AND AIR INTAKE VALVE SERVO MOTOR

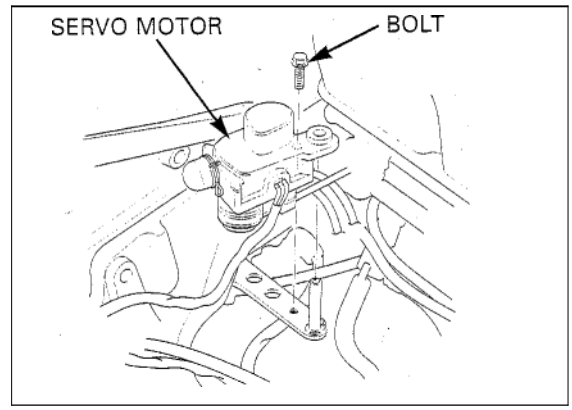
REMOVAL

Remove the fuel tank (page 5-59).

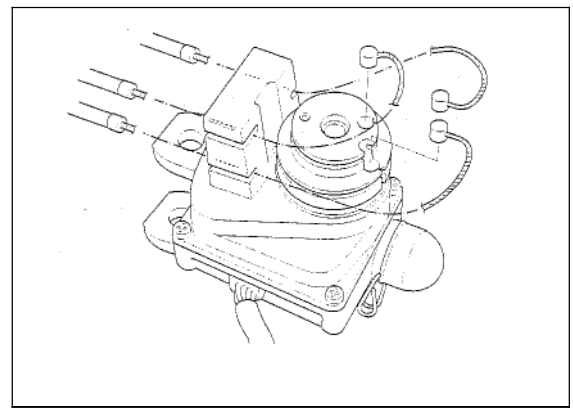
Disconnect the servo motor 6P (Natural) connector.



Remove the servo motor mounting bolt and pull out the servo motor from the bracket.



Disconnect the intake air valve and EGCV control cables from the servo motor pulley, then remove the servo motor.

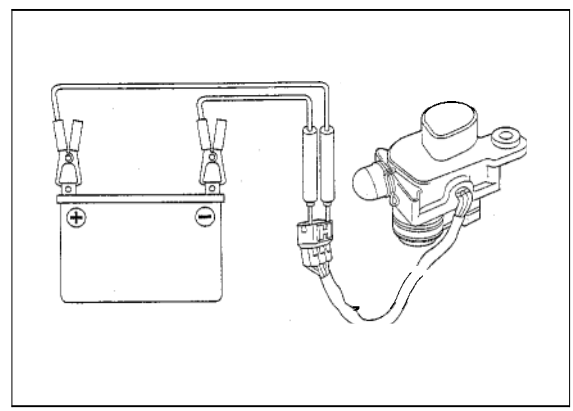


INSPECTION

Connect the 12 V battery to the servo motor 6P (Natural) connector terminals and check that the motor operation.

Connection: Red (+) – Blue (–)

If the servo motor does not turn, replace the servo motor with a new one.

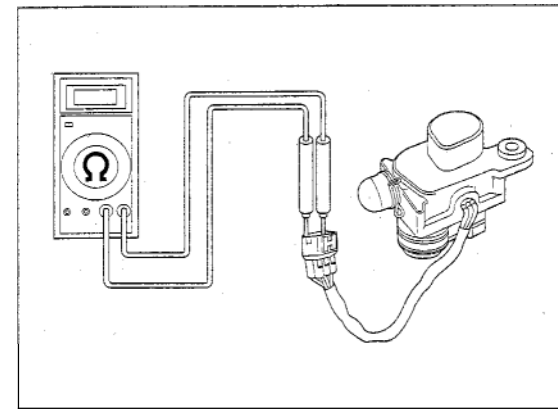


Measure the resistance between the servo motor 6P (Natural) connector terminals.

Connection: Yellow/Red – Green/Orange
Standard: 5 kΩ

Connection: Light green/Pink – Green/Orange
Standard: 0 – 5 kΩ

If the resistance is out of range, replace the servo motor.



INSTALLATION

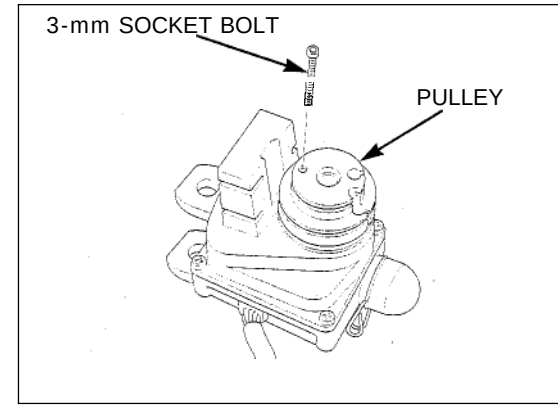
Connect the servo motor 6P (Natural) connector.

If you use a new servo motor, it is not necessary to do this procedure

Short the service check connector (page 5-93).

Turn the ignition switch to "ON".
The servo motor turns, then stops.
Secure the servo motor pulley at this position using a 3-mm socket bolt as shown.

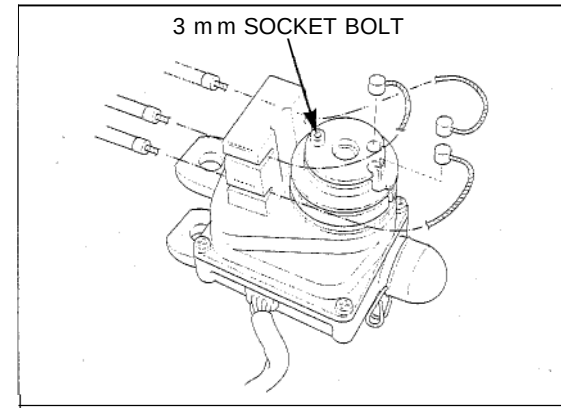
Socket bolt, 3 x 28 mm:
Parts number: 31420–MCJ–640



Connect the EGCV control cables to each position, then connect the intake valve control cable.

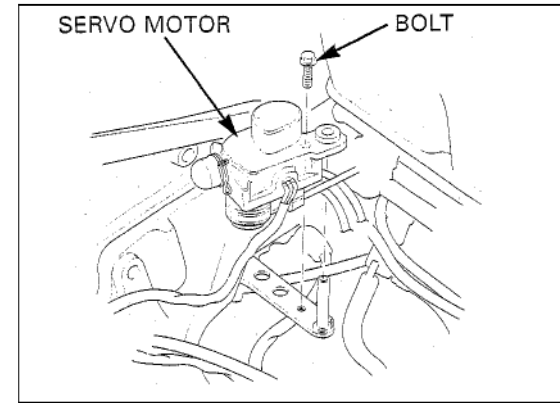
Adjust the EGCV and air intake valve control cables (page 5-93).

Remove the 3-mm socket bolt from the servo motor pulley.



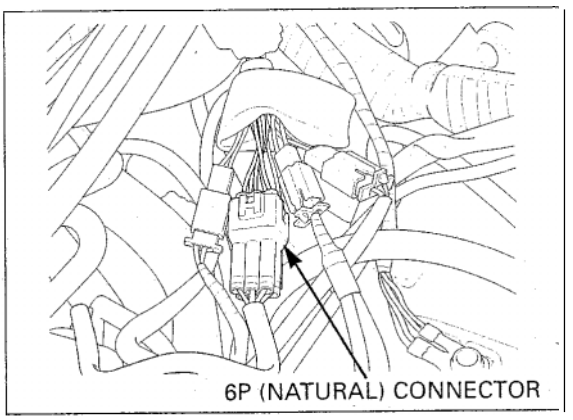
Install the servo motor onto the bracket.

Install and tighten the servo motor mounting bolt.



Connect the servo motor 6P (Natural) connector.

Install the fuel tank (page 5-61).



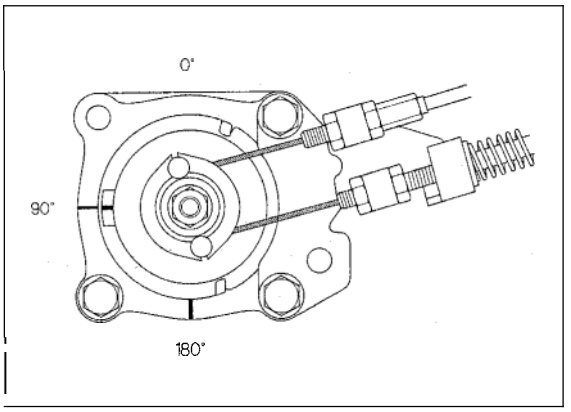
EGCV

OPERATING INSPECTION

Disconnect the EGCV control cables (page 2-15).

Turn the EGCV pulley from 0 to 180" and check for smooth operation.

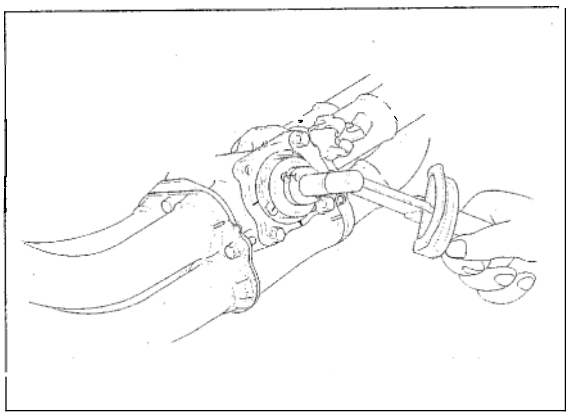
If operation is not smooth, check for carbon deposits in the EGCV and valve body (page 5-99).



Check the EGCV pre-load using a torque wrench.

PRE-LOAD:
0.34 N•m (0.035 kgf•m, 0.25 lbf•ft) maximum

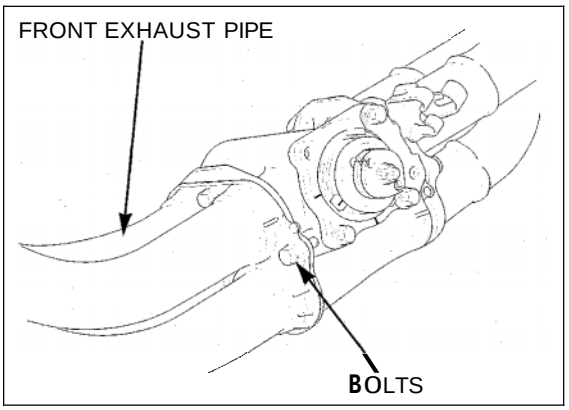
If pre-load is excessive, disassemble and i
EGCV.



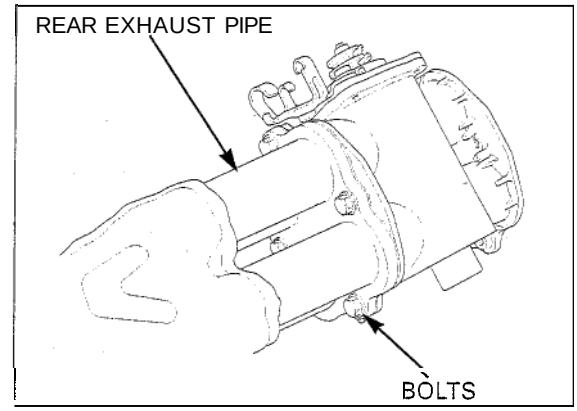
REMOVAL

Remove the exhaust pipe assembly (page 2-13).

Remove the bolts, front exhaust pipe and gasket.

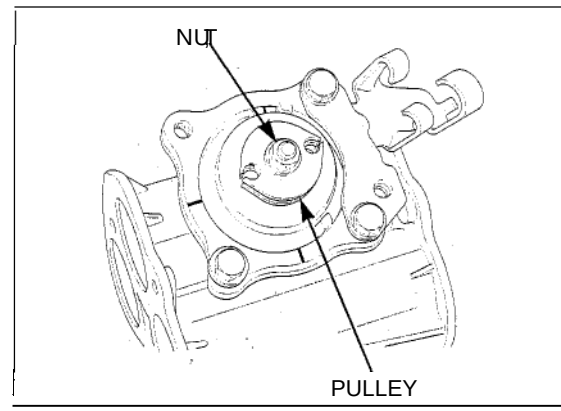


Remove the bolts, rear exhaust pipe and gasket.



DISASSEMBLY

Turn the EGCV cable guide pulley counterclockwise, and seat its tab with the stopper on the valve cover. Loosen and remove the nut, then remove the valve cable guide pulley.

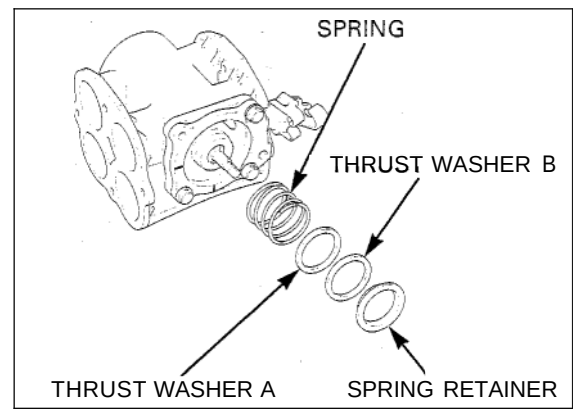


NOTICE

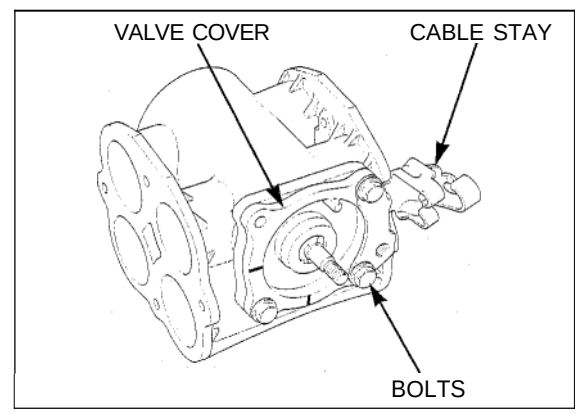
- *Be careful not to damage thrust washer B.*
- *Do not use any cleaning solution to clean thrust washer B.*
- *Do not apply any lubricant to thrust washer B.*

Remove the following:
- Spring retainer
- Thrust washer B
- Thrust washer A
- Thrust spring

Check thrust washer B for wear or damage.
Replace thrust washer B if it is wear or damage.



Remove the EGCV cover mounting bolts, cable stay, EGCV cover and metal gasket.



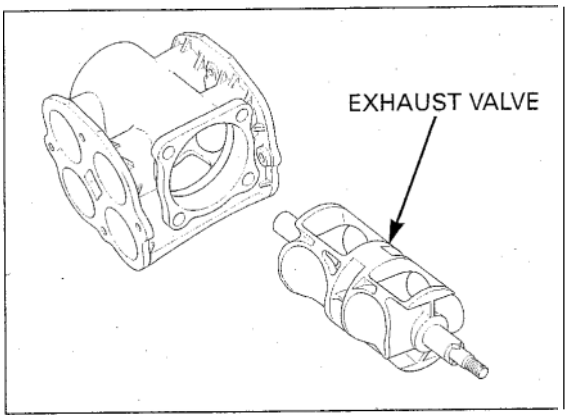
Remove the EGCV from the valve body.

Remove carbon deposits from the EGCV and valve body.

NOTICE

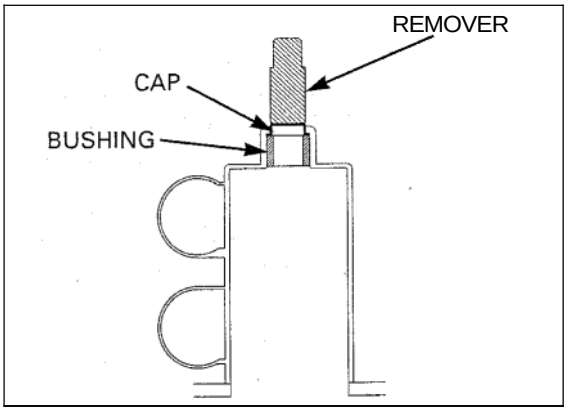
- *Do not use any cleaning solution to clean the EGCV bushings.*
- ***Do** not apply any lubricant to the EGCV bushings.*

Check that the EGCV for wear or damage.
Check that the EGCV body for wear or damage.



EGCV SHAFT BUSHING REPLACEMENT
Remove the valve body side EGCV bushing and cap using the following tools.

TOOL:
Remover, 14 x 16 rnm **07YMF–MCJ0400**



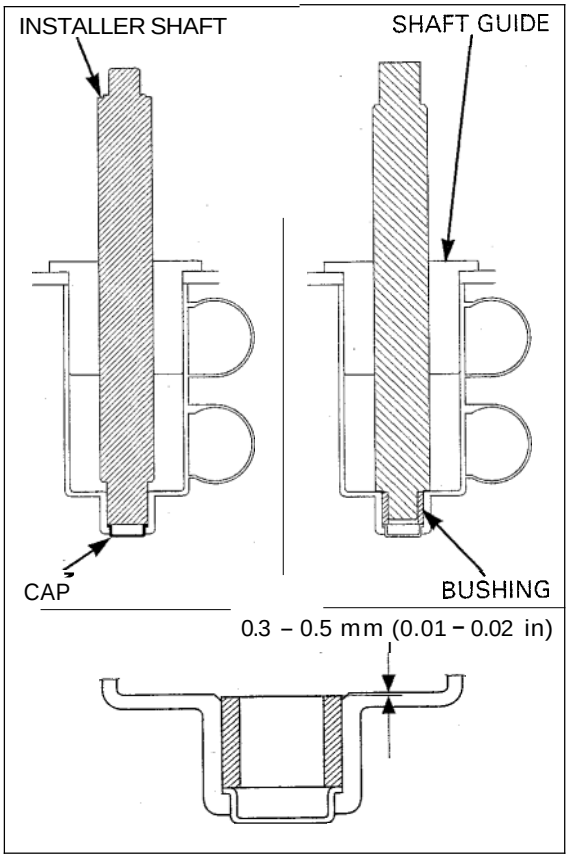
Install the EGCV cap into the EGCV body until it seats using the special tool.

TOOLS:
Installer shaft guide **07YMF–MCJ0100 or 07YMF–MCJA100 (U.S.A. only)**
Installer shaft **07YMF–MCJ0200 or 07YMF–MCJA200 (U.S.A. only)**

Press the EGCV bushing until its end is below 0.3 – 0.5 mm (0.01 – 0.02 in) from the valve body surface as shown

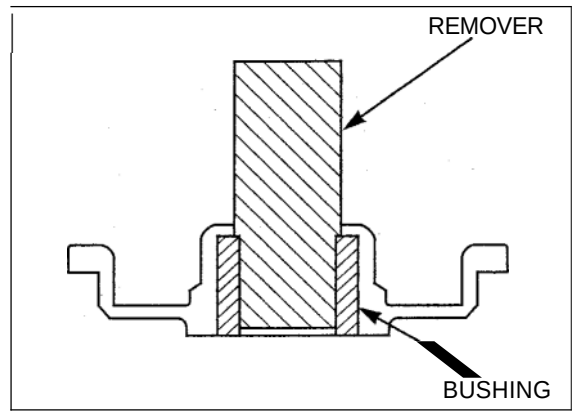
Press the EGCV bushing in using the special tool.

TOOLS:
installer shaft guide **07YMF–MCJ0100 or 07YMF–MCJA100 (U.S.A. only)**
Installer shaft **07YMF–MCJ0200 or 07YMF–MCJA200 (U.S.A. only)**



Press the valve cover side EGCV bushing out using the following tool.

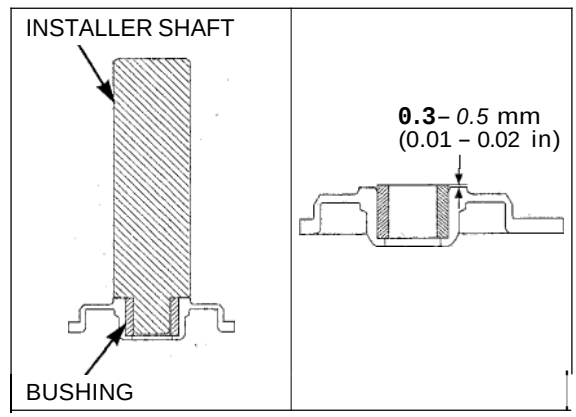
TOOL:
Remover, 14 x 16 mm **07YMF–MCJ0400**



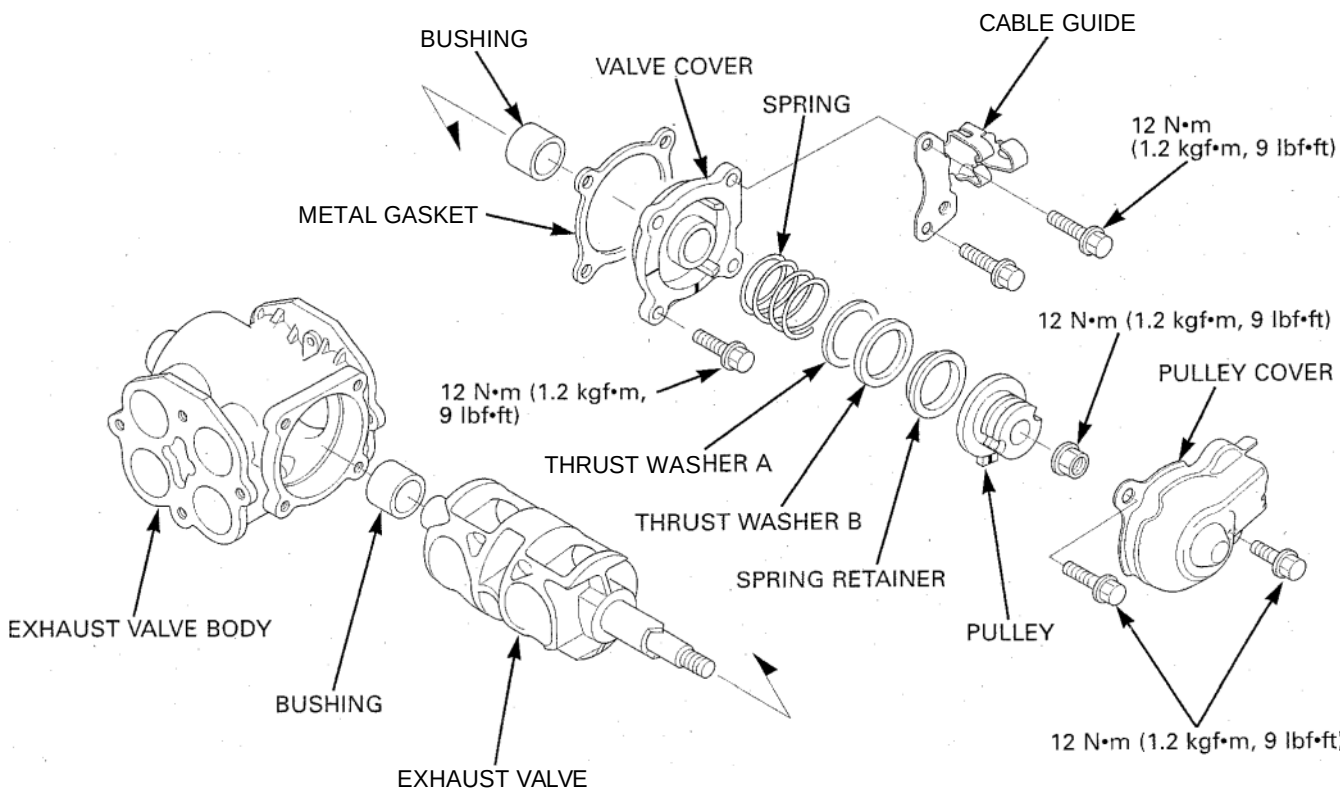
Press the EGCV bushing until its end is projected 0.3 – 0.5 mm (0.01 – 0.02 in) from the valve cover surface as shown

Press the EGCV bushing in using the special tool.

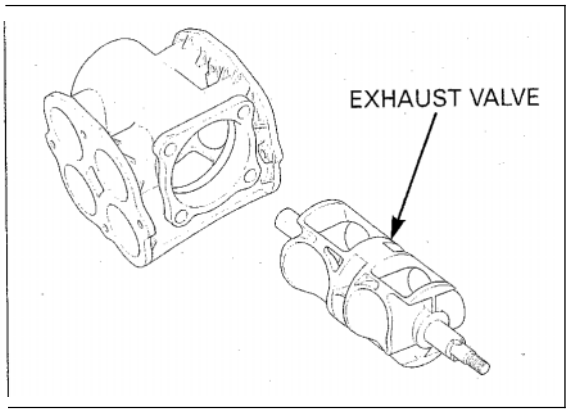
TOOL:
Installer shaft, 14 x 30 mm **07YMF–MCJ0300 or 07YMF–MCJA300 (U.S.A. only)**



ASSEMBLY

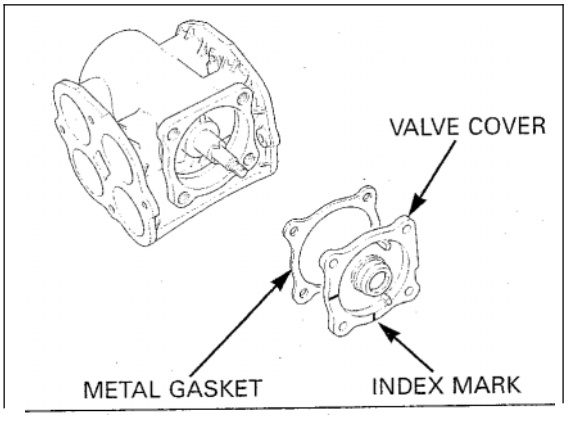


Install the EGCV into the EGCV body.



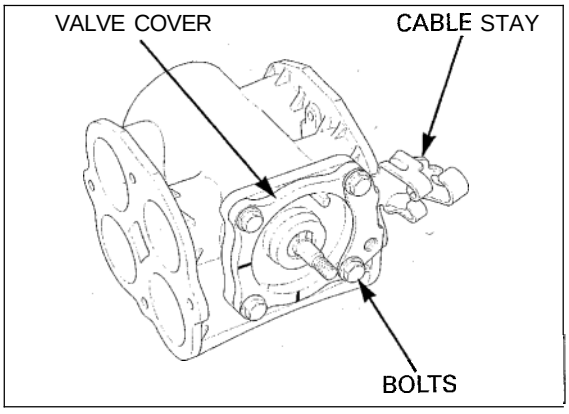
Install the EGCV cover with its index line facing down

Install the metal gasket and EGCV cover.



Install the EGCV cable stay and tighten the four EGCV cover mounting bolts to the specified torque.

TORQUE: 12 N·m (1.2 kgf·m, 9 lbf·ft)

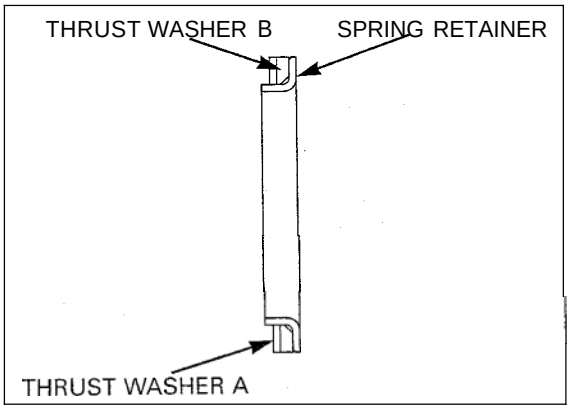


NOTICE

- *Be careful not to damage thrust washer B.*
- *Do not use any cleaning solution to clean thrust washer B.*
- *Do not apply any lubricant to thrust washer B.*

Install thrust washer B with its chamfered side facing the spring retainer.

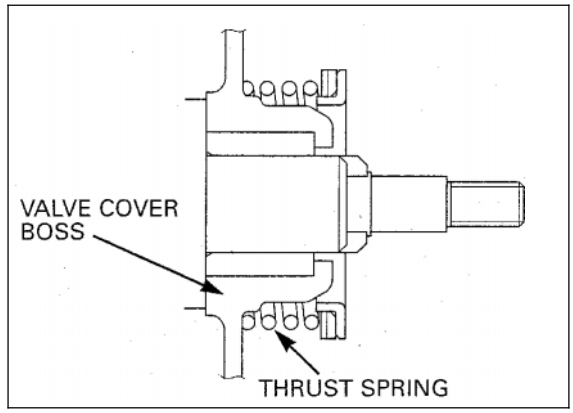
Install thrust washers B and A onto the spring retainer.



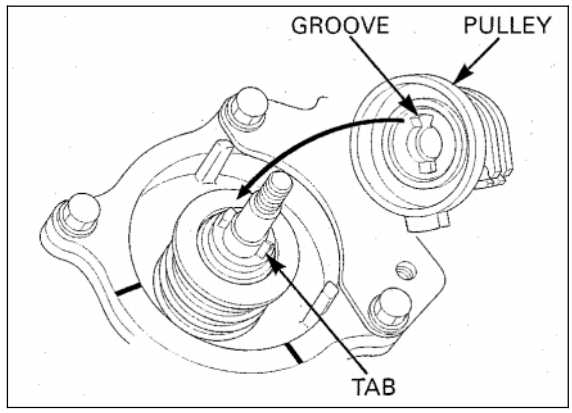
Make sure the thrust spring is seated on the EGCV cover boss

Install the thrust spring onto the EGCV cover.

Install the spring retainer assembly onto the thrust spring.

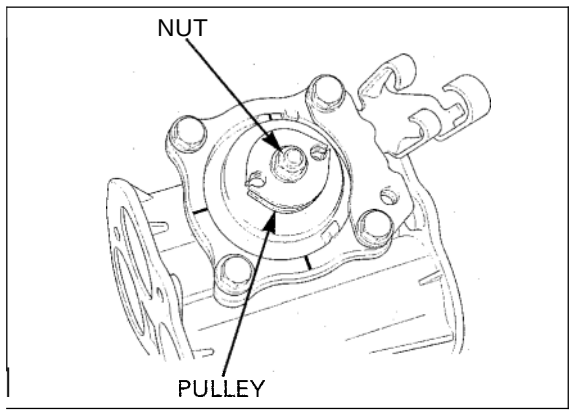


Install the valve cable guide pulley aligning its cut-out with the the valve shaft tab as shown.



Install the valve cable guide pulley flange nut.
Turn the valve cable guide pulley clockwise, seat the pulley tab with the stopper on the valve cover.
Tighten the nut to the specified torque.

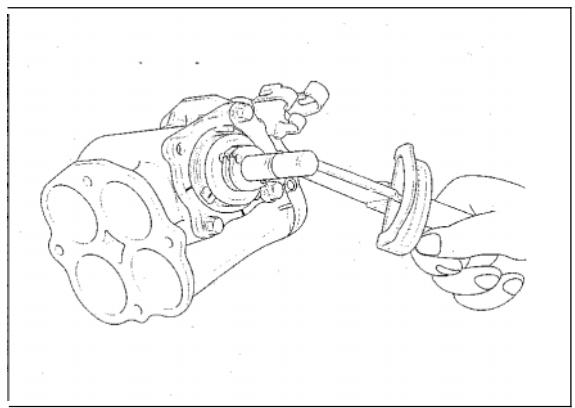
TORQUE: 12 N·m (1.2 kgf·m, 9 lbf·ft)



Check the EGCV pre-load using a torque wrench.

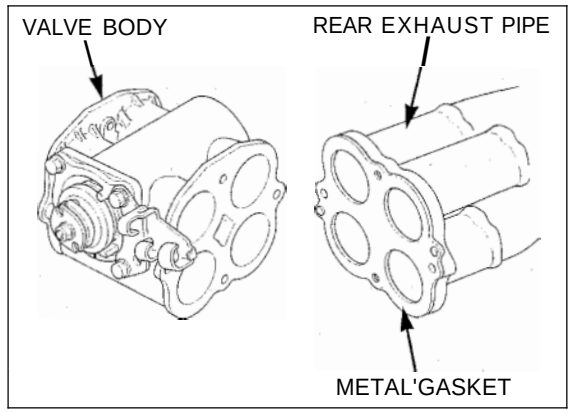
PRE-LOAD:
0.34 N·m (0.035 kgf·m, 0.25 lbf·ft) maximum

If pre-load is excessive, reassemble the EGCV.



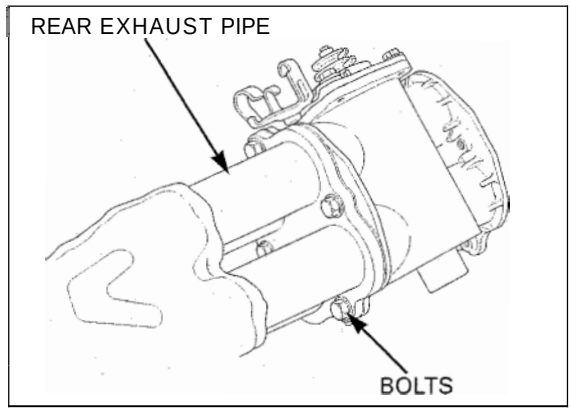
INSTALLATION

Install the metal gasket and rear exhaust pipe onto the EGCV body.

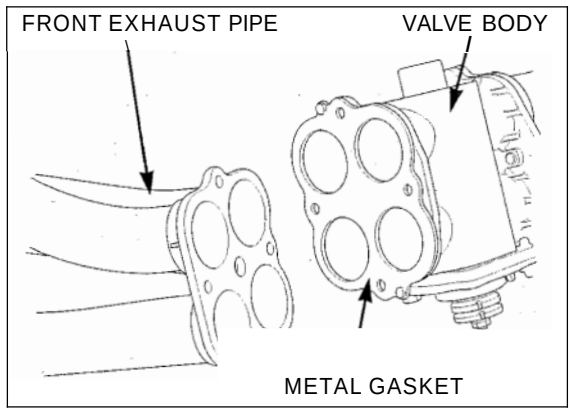


Tighten the EGCV mounting bolt to the specified torque.

TORQUE: 14 N·m (1.4 kgf·m, 10 lbf·ft)

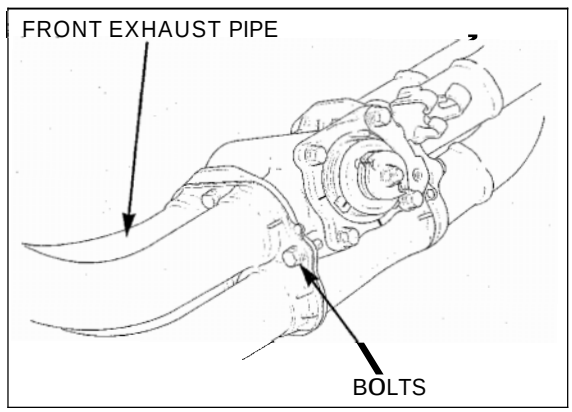


Install the metal gasket and front exhaust pipe onto the EGCV body.



Tighten the EGCV mounting bolt to the specified torque.

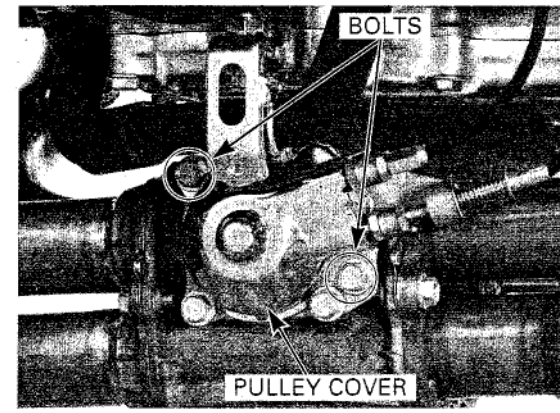
TORQUE: 14 N·m (1.4 kgf·m, 10 lbf·ft)



Install the exhaust pipe assembly (page 2-16).
Connect the EGCV control cables and adjust the control cables (page 5-93).

Remove the EGCV cover front upper bolt.
Install EGCV cable guide pulley cover and tighten the bolts to the specified torque.

TORQUE: 12 N•m (1.2 kgf•m, 9 lbf•ft)

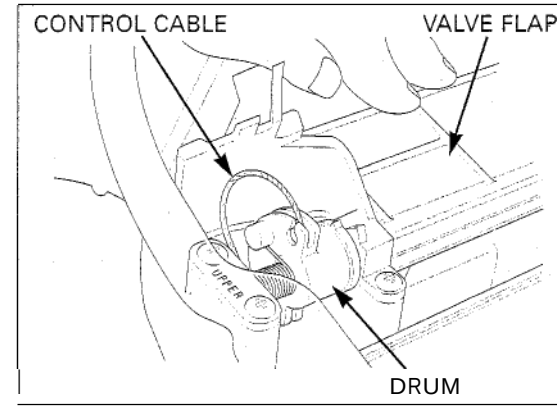


VARIABLE AIR INTAKE VALVE

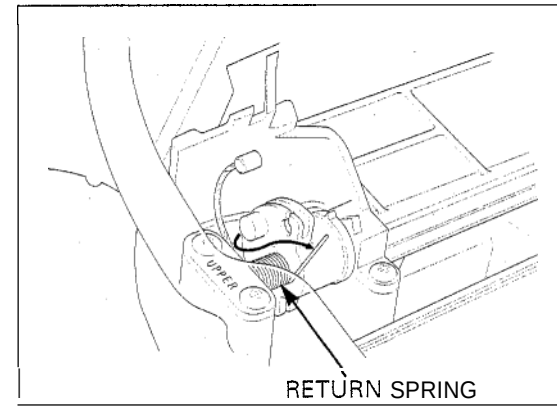
DISASSEMBLY

Remove the air cleaner housing (page 5-64).

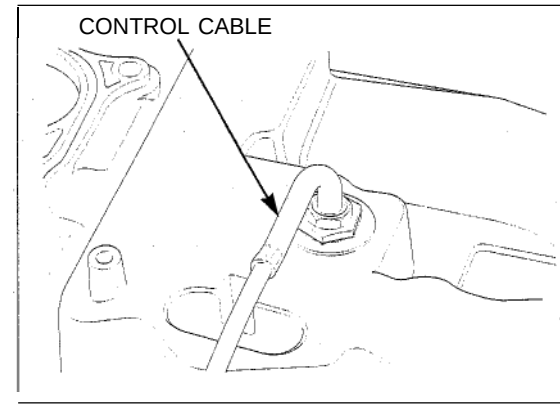
Open the intake valve flap by hand, disconnect the intake valve cable end from the drum.



Unhook the return spring ends from the hooks.

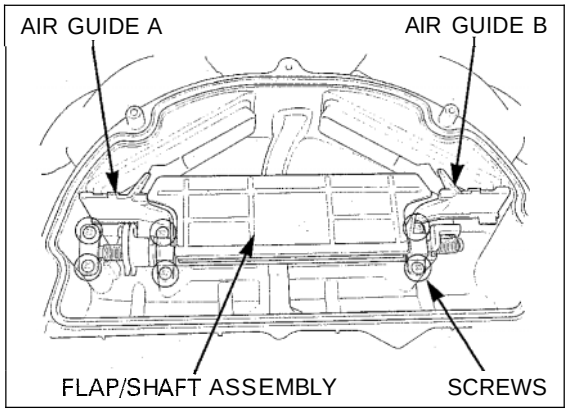


If necessary, loosen the control cable nut and remove the control cable from the air cleaner housing.

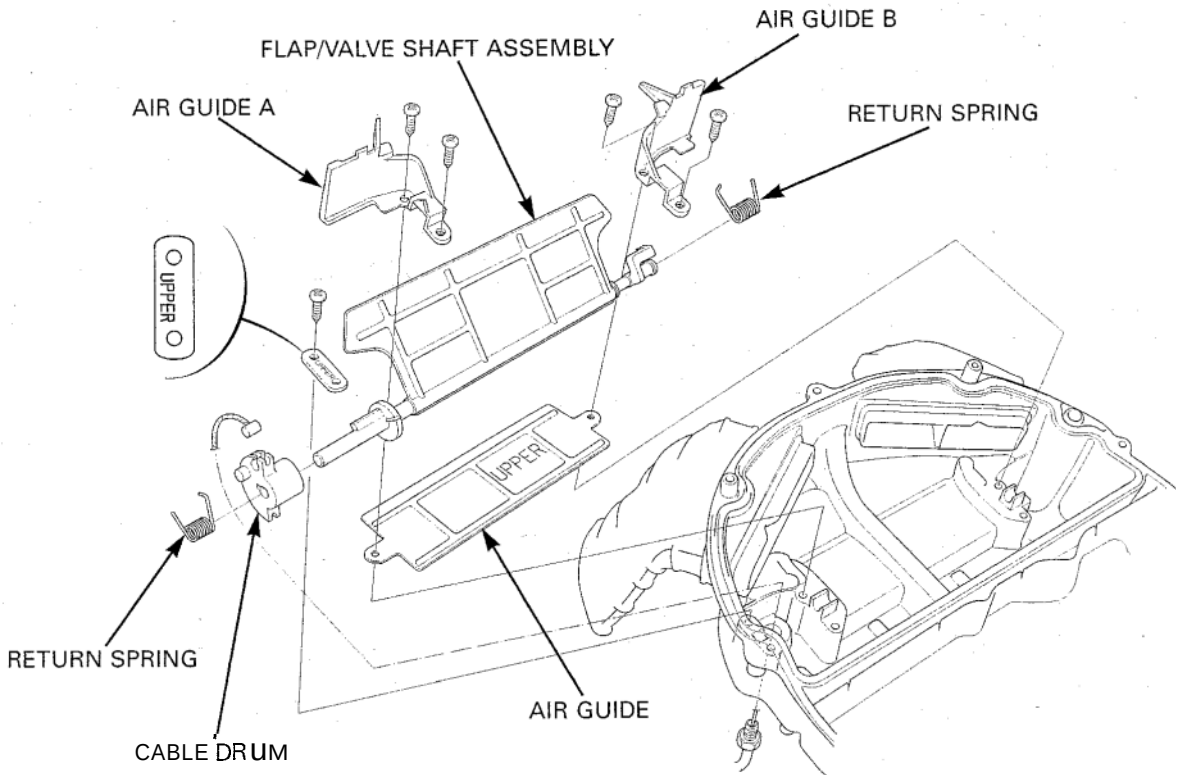


Remove the intake valve shaft holder mounting screws and holder.
Remove air guides A and B mounting screws.

Remove the intake valve flap/shaft assembly, air guides A and B.

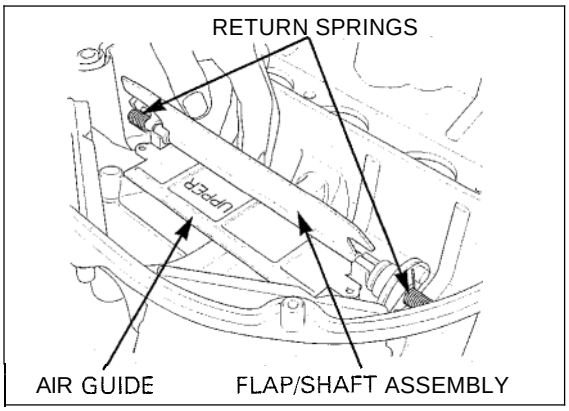


ASSEMBLY

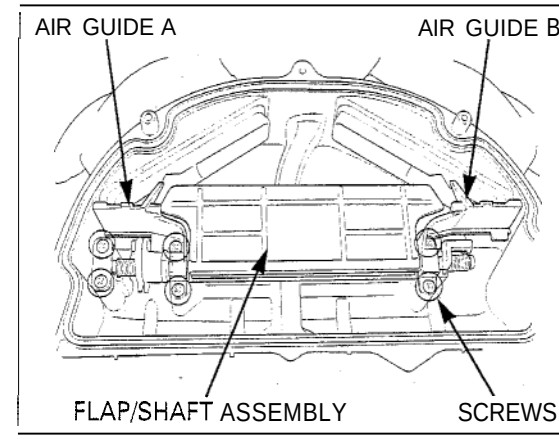


Install the intake valve drum onto the shaft aligning its groove with the intake valve shaft boss.
Install the return spring on both sides.

Install the air guide with its "UPPER" mark facing up.
Install the intake valve flap/shaft assembly onto the air cleaner housing.

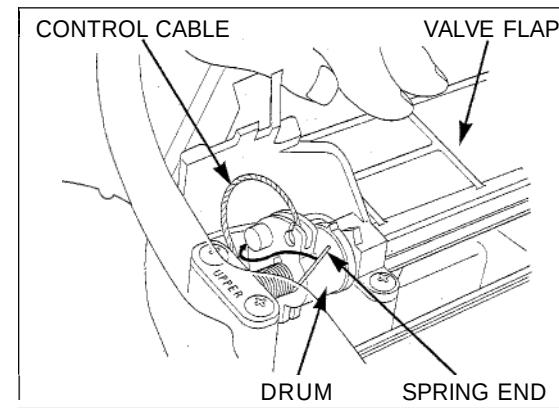


Install air guides A and B, then tighten the mounting screws.
Install the intake valve shaft holder plate with its "UPPER" mark facing up.
install and tighten the mounting screws.



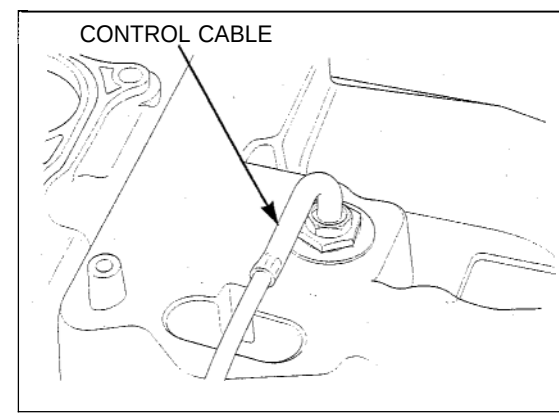
Open the intake valve flap by hand, connect the intake valve control cable end to the drum.

Turn the return spring end counterclockwise turn and then install it onto the hook as shown.



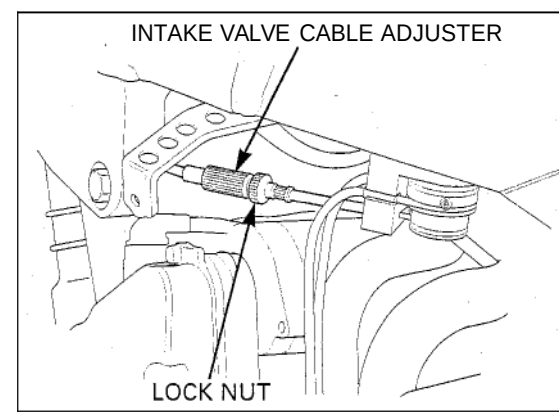
Face the control cable to the left, then tightening the lock nut

Tighten the cable lock nut securely if it is removed.

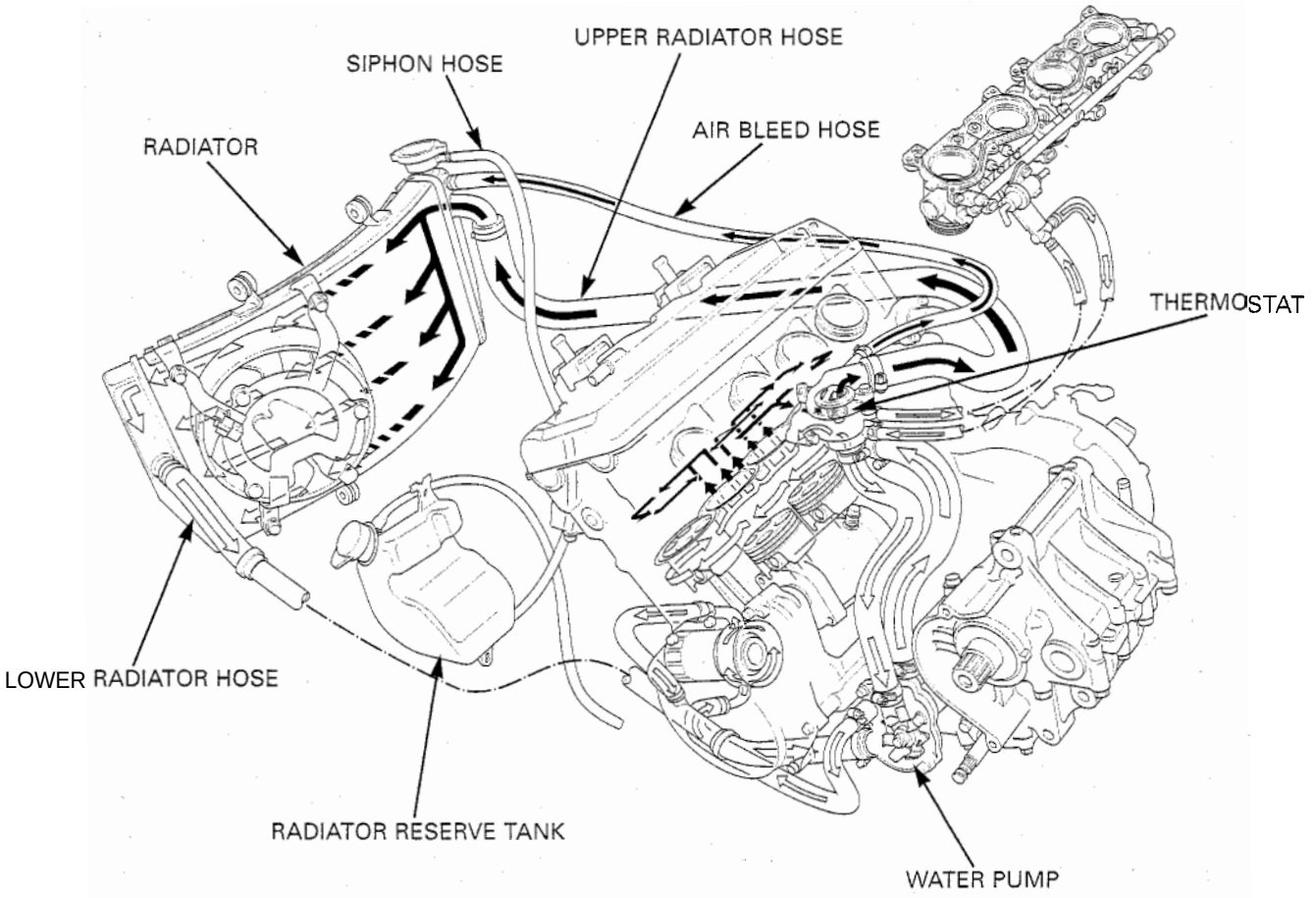


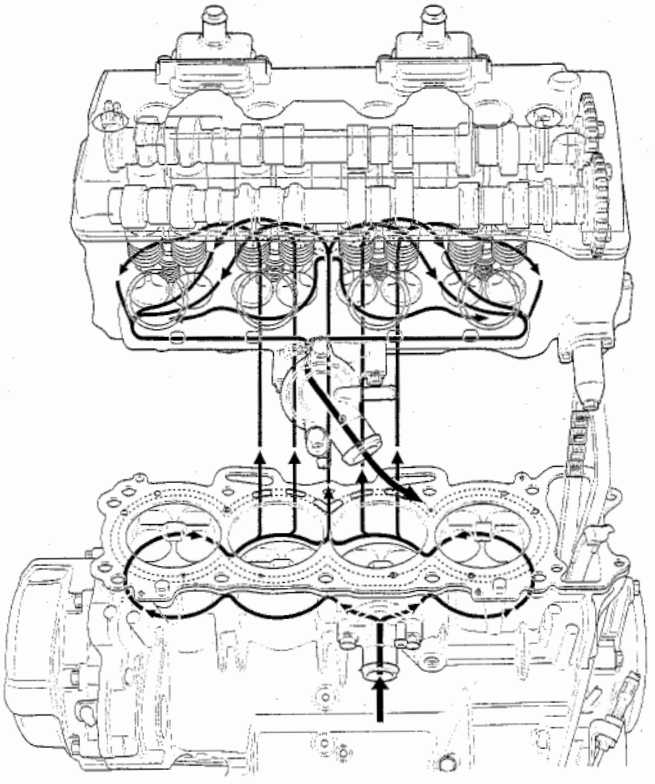
Install the air cleaner housing (page 5-65),

Adjust the variable air intake valve control cable (page 5-94).



SYSTEM FLOW PATTERN





6. COOLING SYSTEM

SYSTEM FLOW PATTERN	6-0	THERMOSTAT	6-6
SERVICE INFORMATION	6-1	RADIATOR	6-8
TROUBLESHOOTING	6-2	WATER PUMP	6-13
SYSTEM TESTING	6-3	RADIATOR RESERVE TANK	6-16
COOLANT REPLACEMENT	6-4	FAN CONTROL RELAY	6-17

SERVICE INFORMATION

GENERAL

⚠ WARNING

Removing the radiator cap while the engine is hot can cause the coolant to spray out, seriously scalding you.

Always let the engine and radiator cool down before removing the radiator cap.

NOTICE

Using coolant *with* silicate inhibitors may cause premature *wear of* water pump seals *or* blockage *of radiator* passages. Using tap water may cause engine damage.

- Add cooling system at the reserve tank. Do not remove the radiator cap except to refill or drain the system.
- All cooling system services can be done with the engine in the frame.
- Avoid spilling coolant on painted surfaces.
- After servicing the system, check for leaks with a cooling system tester.
- Refer to section 19 for coolant temperature sensor inspection.

SPECIFICATIONS

ITEM		SPECIFICATIONS
Coolant capacity	Radiator and engine	3.1 liter (3.3 US qt, 2.7 Imp qt)
	Reserve tank	0.4 liter (0.4 US qt, 0.4 Imp qt)
Radiator cap relief pressure		108 – 137 kPa (1.1 – 1.4 kgf/cm², 16 – 20 psi)
Thermostat	Begin to open	80.5 – 83.5°C (177 – 182°F)
	Fully open	95°C (203°F)
	Valve lift	8 mm (0.3 in) minimum
Recommended antifreeze		Pro Honda HP Coolant or an equivalent high quality ethylene glycol antifreeze containing corrosion protection inhibitors
Standard coolant concentration		1:1 mixture of antifreeze and soft water

TORQUE VALUES

Water pump cover bolt	12 N•m (1.2 kgf•m, 9 lbf•ft)	CT bolt
ECT (Engine Coolant Temperature)/thermo sensor	23 N•m (2.3 kgf•m, 17 lbf•ft)	Apply sealant to the threads.
Thermostat cover flange bolt	12 N•m (1.2 kgf•m, 9 lbf•ft)	CT bolt
Cooling fan nut	3 N•m (0.27 kgf•m, 2.0 lbf•ft)	Apply a locking agent to the threads.
Fan motor nut	5 N•m (0.5 kgf•m, 3.6 lbf•ft)	
Fan motor shroud mounting bolt	8 N•m (0.8 kgf•m, 5.8 lbf•ft)	

TROUBLESHOOTING

Engine temperature too high
- Faulty radiator cap
- Insufficient coolant
- Passages blocked in radiator, hoses or water jacket
- Air in system
- Faulty water pump
- Thermostat stuck closed
- Faulty temperature gauge or coolant temperature sensor
- Faulty cooling fan motor
- Faulty fan control relay

Engine temperature too low
- Faulty temperature gauge or ECT/thermo sensor
- Thermostat stuck open
- Faulty fan control relay

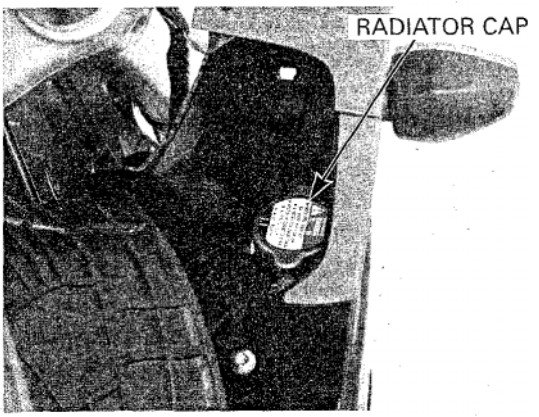
Coolant leak
- Faulty water pump mechanical seal
- Deteriorated O-rings
- Damaged or deteriorated gasket
- Loose hose connection or clamp
- Damaged or deteriorated hose
- Faulty radiator cap

SYSTEM TESTING

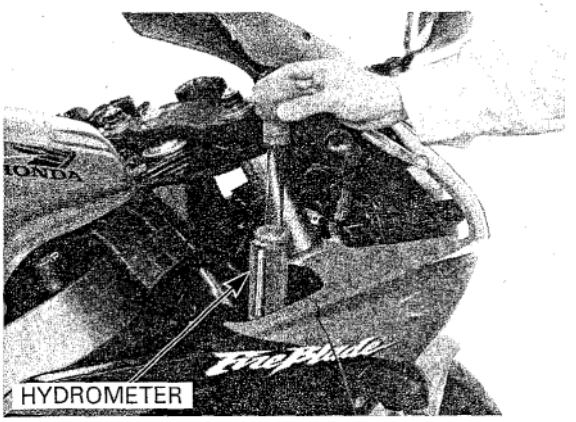
COOLANT (HYDROMETER TEST)

Remove the right duct cover (page 2-4).

Remove the radiator cap.



Test the coolant specific gravity using a hydrometer (see below for "Coolant gravity chart").
For maximum corrosion protection, a 1:1 solution of ethylene glycol and distilled water is recommended (page 6-4).
Look for contamination and replace the coolant if necessary.



COOLANT GRAVITY CHART

Coolant temperature ˚C (˚F) / Coolant ratio %	0 (32)	5 (41)	10 (50)	15 (59)	20 (68)	25 (77)	30 (86)	35 (95)	40 (104)	45 (113)	50 (122)
5	1.009	1.009	1.008	1.008	1.007	1.006	1.005	1.003	1.001	0.999	0.997
10	1.018	1.017	1.017	1.016	1.015	1.014	1.013	1.011	1.009	1.007	1.005
15	1.028	1.027	1.026	1.025	1.024	1.022	1.020	1.018	1.016	1.014	1.012
20	1.036	1.035	1.034	1.033	1.031	1.029	1.027	1.025	1.023	1.021	1.019
25	1.045	1.044	1.043	1.042	1.040	1.038	1.036	1.034	1.031	1.028	1.025
30	1.053	1.052	1.051	1.047	1.046	1.045	1.043	1.041	1.038	1.035	1.032
35	1.063	1.062	1.060	1.058	1.056	1.054	1.052	1.049	1.046	1.043	1.040
40	1.072	1.070	1.068	1.066	1.064	1.062	1.059	1.056	1.053	1.050	1.047
45	1.080	1.078	1.076	1.074	1.072	1.069	1.066	1.063	1.060	1.057	1.054
50	1.086	1.084	1.082	1.080	1.077	1.074	1.071	1.068	1.065	1.062	1.059
55	1.095	1.093	1.091	1.088	1.085	1.082	1.079	1.076	1.073	1.070	1.067
60	1.100	1.098	1.095	1.092	1.089	1.086	1.083	1.080	1.077	1.074	1.071

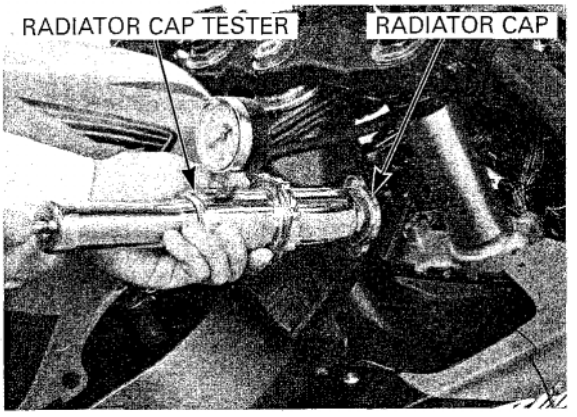
RADIATOR CAP/SYSTEM PRESSURE INSPECTION

Before installing the cap in the tester, wet the sealing surfaces

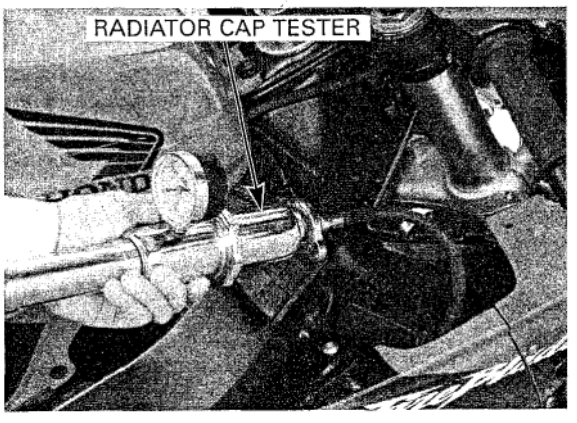
Remove the radiator cap (page 6-3).

Pressure test the radiator cap.
Replace the radiator cap if it does not hold pressure, or if relief pressure is too high or too low.
It must hold the specified pressure for at least 6 seconds.

RADIATOR CAP RELIEF PRESSURE:
108 – 137 kPa (1.1 – 1.4 kgf/cm², 16 – 20 psi)



Pressurize the radiator, engine and hoses, and check for leaks.



NOTICE

Excessive pressure can damage the cooling system components. Do not exceed 137 kPa (1.4 kgf/cm², 20 psi).

Repair or replace components if the system will not hold the specified pressure for at least 6 seconds.

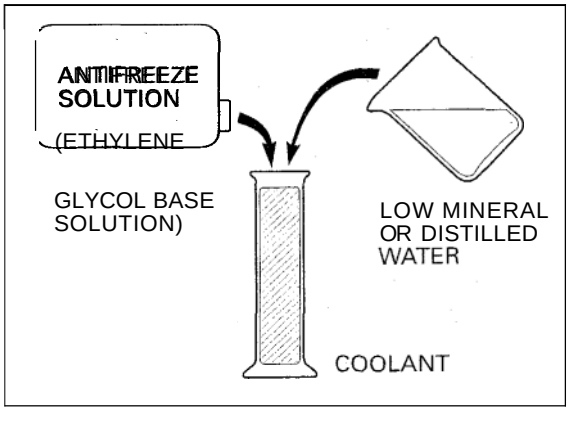
COOLANT REPLACEMENT

PREPARATION

- The effectiveness of coolant decreases with the accumulation of rust or if there is a change in the mixing proportion during usage. Therefore, for best performance change the coolant regularly as specified in the maintenance schedule.
- Mix only distilled, low mineral water with the antifreeze.

RECOMMENDED ANTIFREEZE:
Pro Honda HP Coolant or an equivalent high quality ethylene glycol antifreeze containing corrosion protection inhibitors

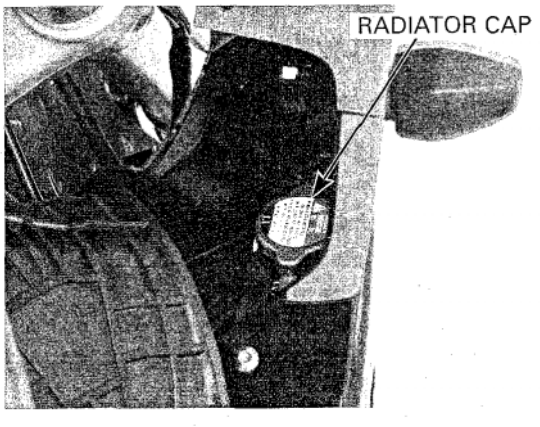
RECOMMENDED MIXTURE:
1:1 **(Distilled water and antifreeze)**



REPLACEMENT/AIR BLEEDING

When filling the system or reserve tank with coolant (checking cooiant level), place the rnotorcycie in a verticai position on a flat, level surface

Remove the radiator cap.



Remove the lower cowl (page 2-7)

Remove the drain bolt on the water pump cover and drain the system coolant.

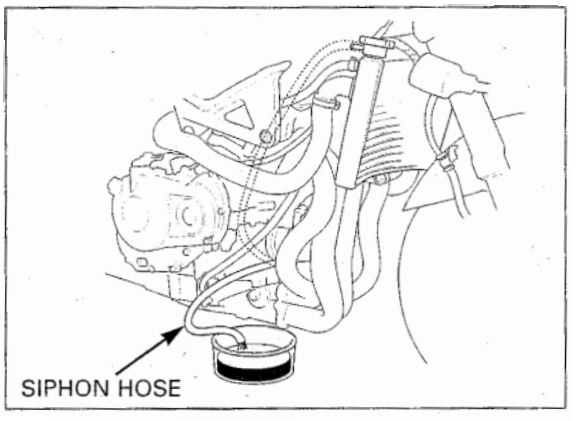
Remove the cylinder drain bolt and drain the coolant from the cylinder.

Reinstall the drain bolt with a new sealing washer.

Disconnect the siphon hose from the radiator.

Drain the reserve tank coolant.
Empty the coolant and rinse the inside of the reserve tank with water.

Reinstall the radiator siphon hose.

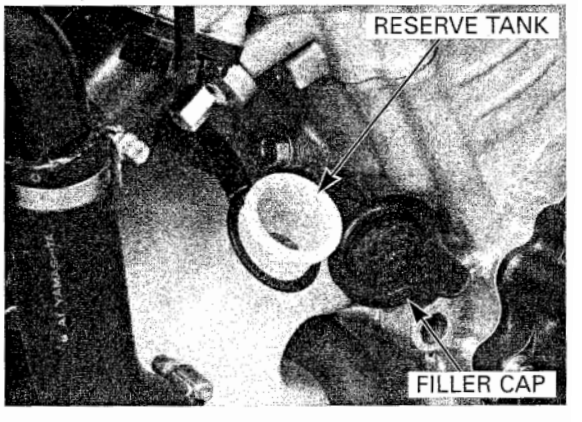


Fill the system with the recommended coolant through the filler opening up to the filler neck.

Remove the radiator reserve tank cap and fill the reserve tank to the upper level line.

Bleed air from the system as follow:

1. Shift the transmission into neutral. Start the engine and let it idle for 2 – 3 minutes.
2. Snap the throttle three to four times to bleed air from the system.
3. Stop the engine and add coolant up to the proper level if necessary. Reinstall the radiator cap.
4. Check the level of coolant in the reserve tank and fill to the upper level if it is low.

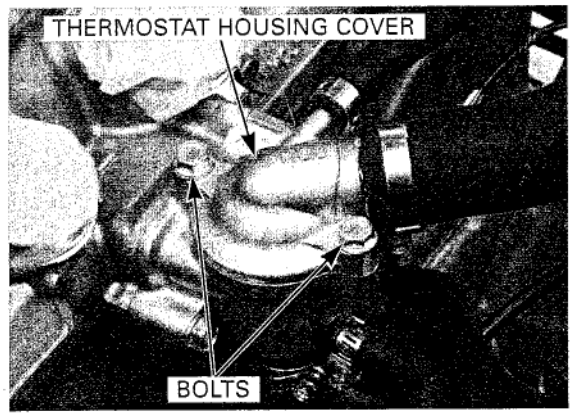


THERMOSTAT

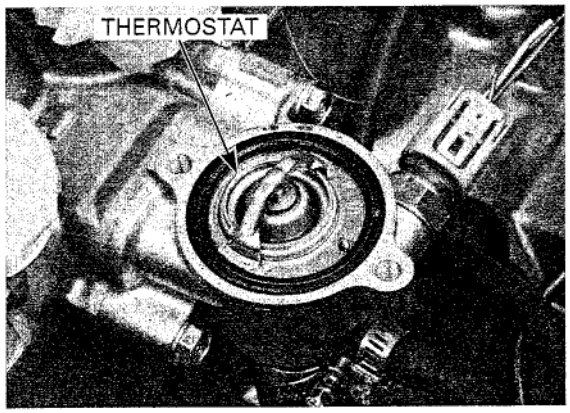
THERMOSTAT REMOVAL

Drain the coolant (page 6-4).
Remove the throttle body (page *5-67*).

Remove the bolts and thermostat housing cover.



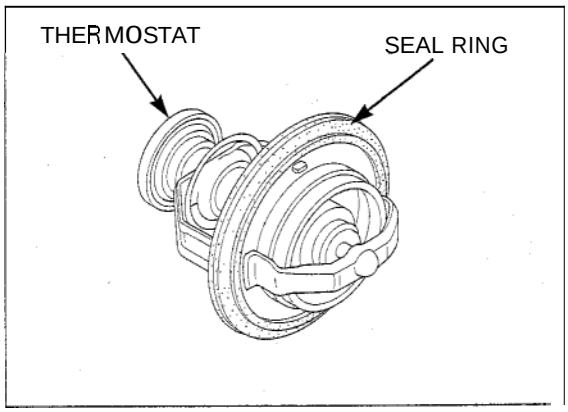
Remove the thermostat from the housing.



INSPECTION

Wear insulated gloves and adequate eye protection.
Keep flammable materials away from the electric heating element.

Visually inspect the thermostat for damage.
Check for damage of the seal ring.

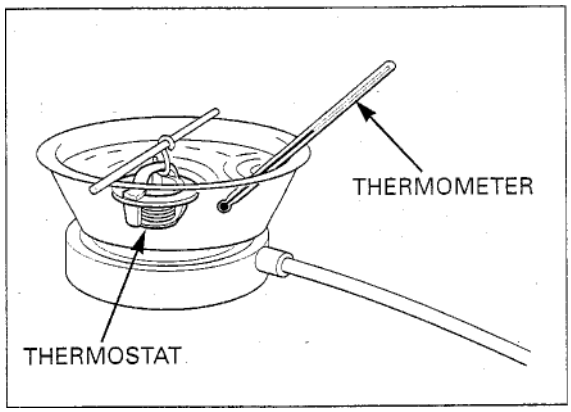


Do not let the thermostat or thermometer touch the pan, or you will get false reading

Heat the water with an electric heating element to operating temperature for 5 minutes.
Suspend the thermostat in heated water to check its operation.

Replace the thermostat if the valve stays open at room temperature, or if it responds at temperatures other than those specified.

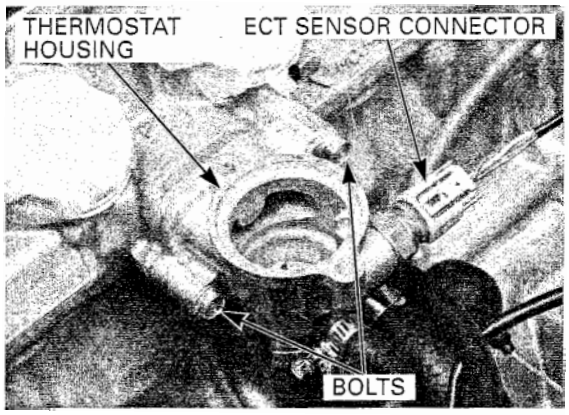
THERMOSTAT BEGIN TO OPEN:
80.5– 83.5°C (177 – 182 °F)
VALVE LIFT:
8 mm (0.3 in) minimum at 95 °C (203 °F)



THERMOSTAT HOUSING REMOVAL

Disconnect the ECT sensor connector.

Remove the bolts and thermostat housing from the cylinder head.

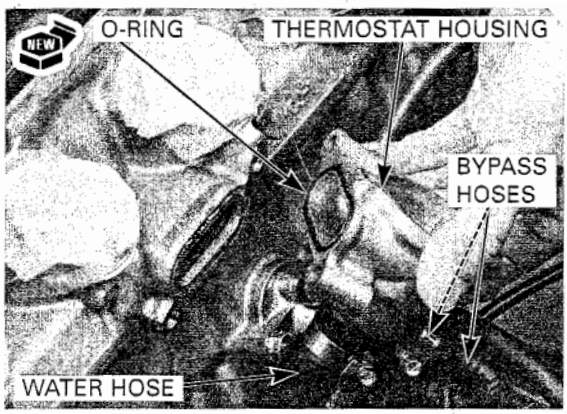


Disconnect the fast idle wax unit water hose and bypass hoses from the thermostat housing.

THERMOSTAT HOUSING INSTALLATION

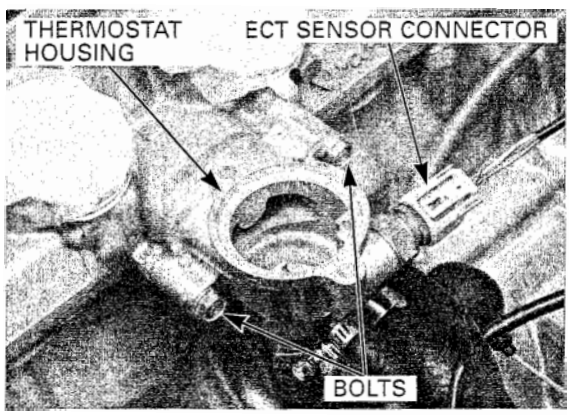
Connect the fast idle wax unit water hose and bypass hoses.

Install a new O-ring into the groove of the thermostat body.
Install the thermostat housing onto the cylinder head.



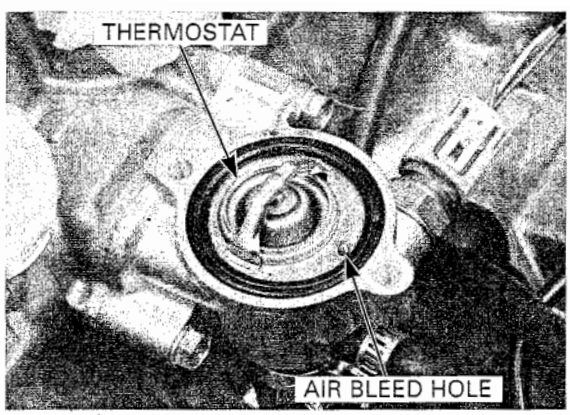
Install and tighten the thermostat housing mounting bolts.

Connect the ECT sensor connector.



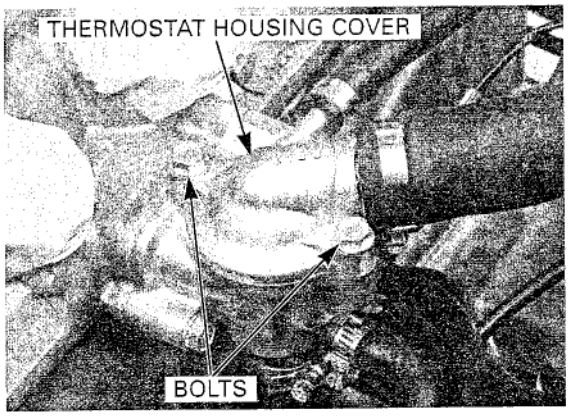
THERMOSTAT INSTALLATION

Install the thermostat into the housing with its air bleed hole facing rearward.



Install the thermostat housing cover onto the housing.
Install and tighten the housing cover bolts.

Fill the system with the recommended coolant and bleed any air (page 6-5).



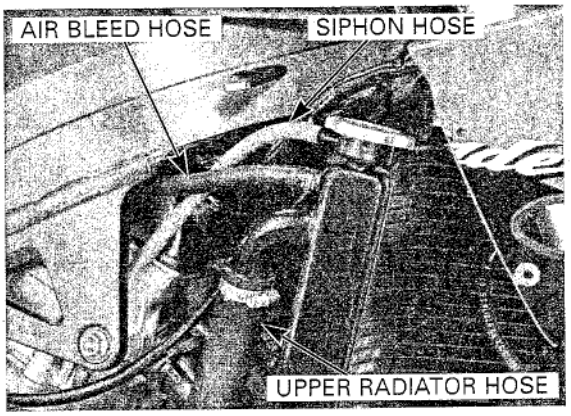
RADIATOR

REMOVAL

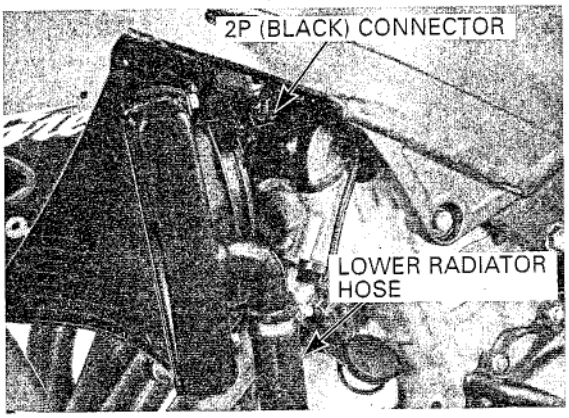
Remove the following:
- Lower cowl (page 2-7)
- Inner middle cowl (page *2-7)*

Drain the coolant (page 6-4).

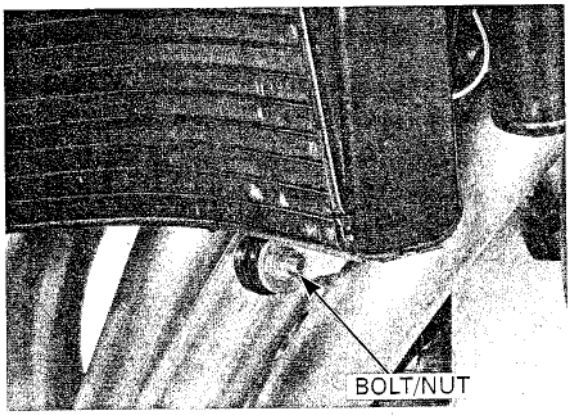
Disconnect the siphon hose and air bleed hose from the radiator.
Disconnect the upper radiator hose.



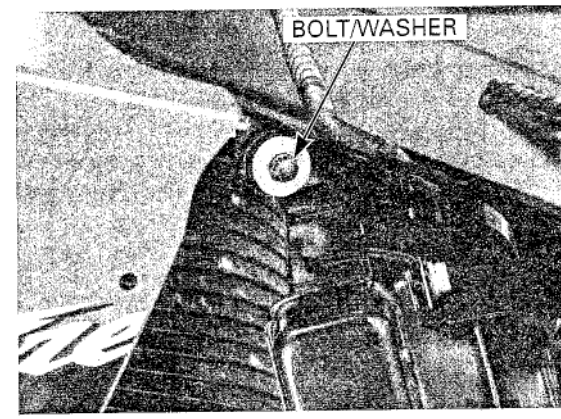
Disconnect the radiator fan motor 2P (Black) connector.
Disconnect the lower radiator hose.



Remove the radiator lower mounting bolt/nut

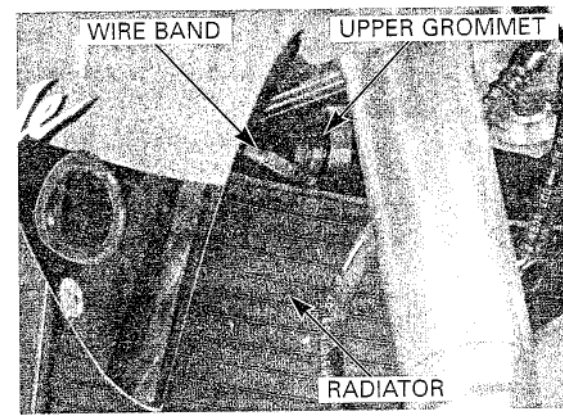


Remove the radiator upper mounting bolt and washer.



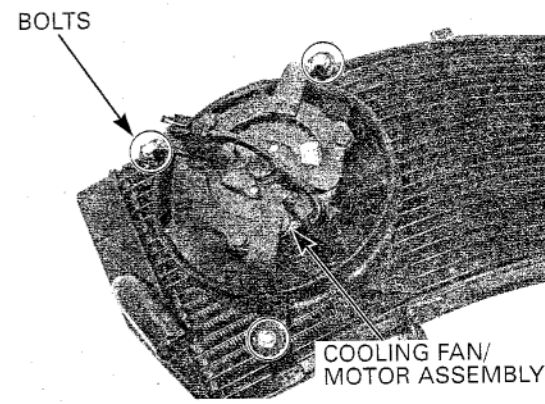
Slide the radiator to the right, then release the upper grommet from the frame boss.
Remove the radiator assembly.

Be careful not to damage the radiator core

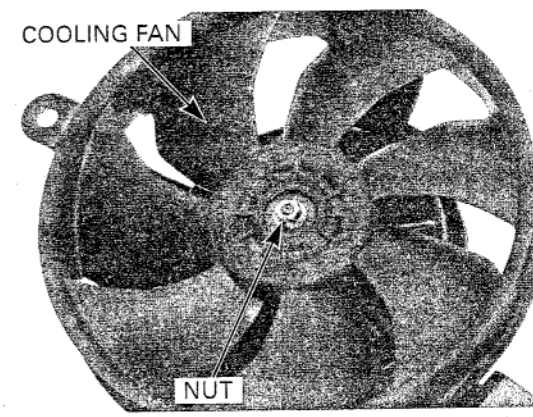


DISASSEMBLY

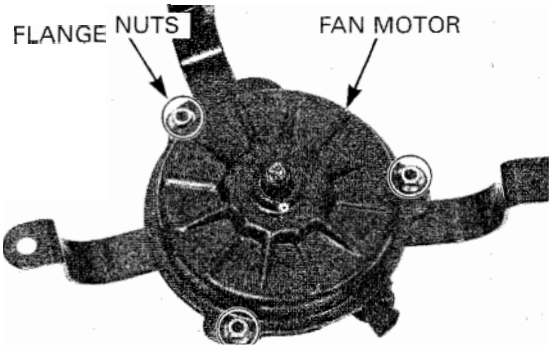
Remove the three bolts and cooling fan/motor assembly.



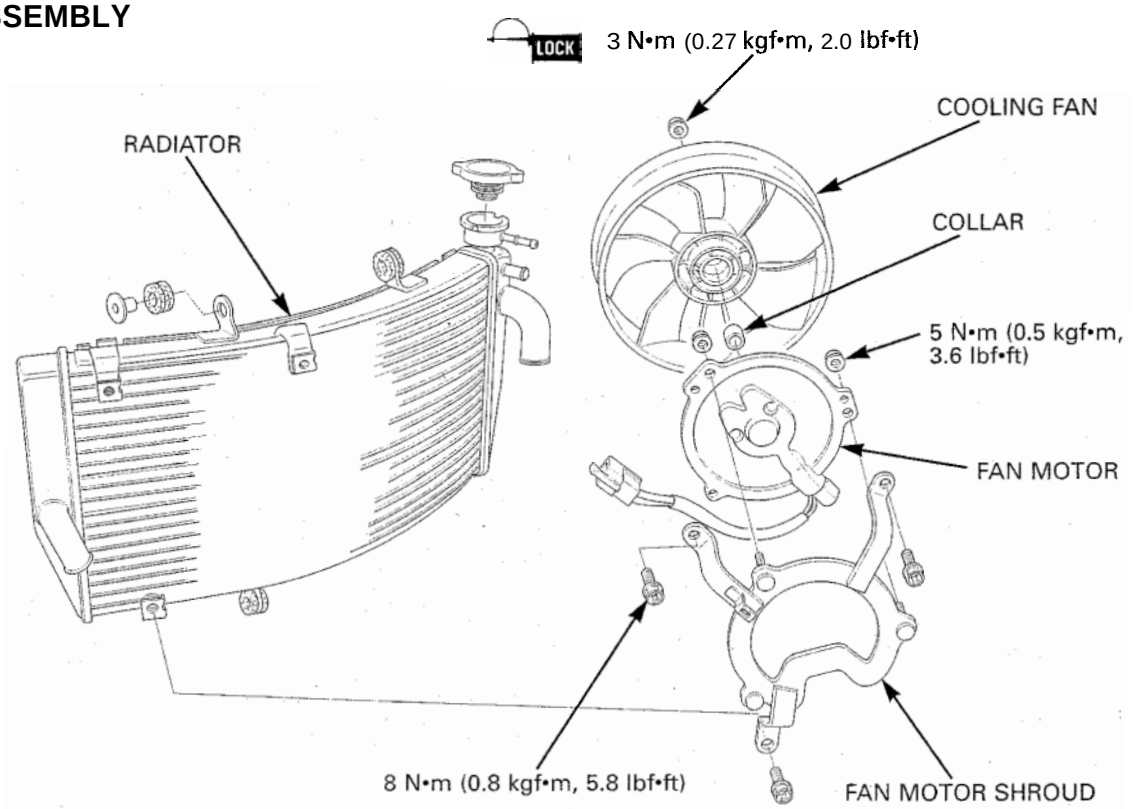
Remove the nut, cooling fan and distance collar.



Remove the flange nuts and fan motor from the fan motor shroud.

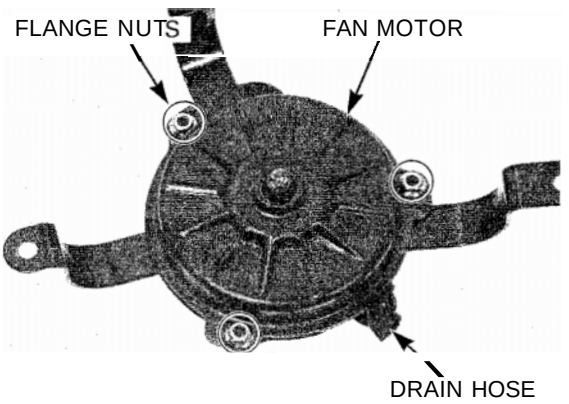


ASSEMBLY

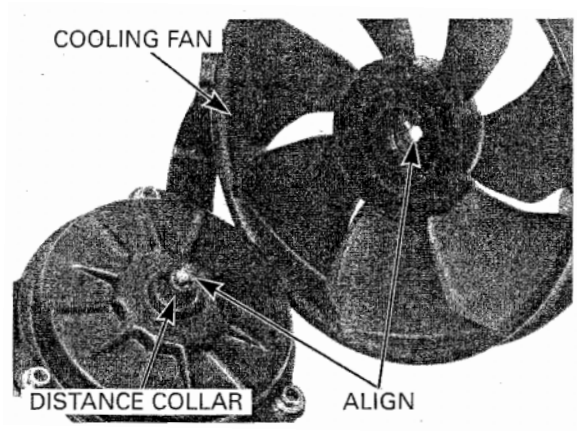


Install the fan motor onto the fan motor shroud with the drain hose facing as shown.
Tighten the flange nuts to the specified torque.

TORQUE: 5 N•m (0.5 kgf•m, 3.6 lbf•ft)

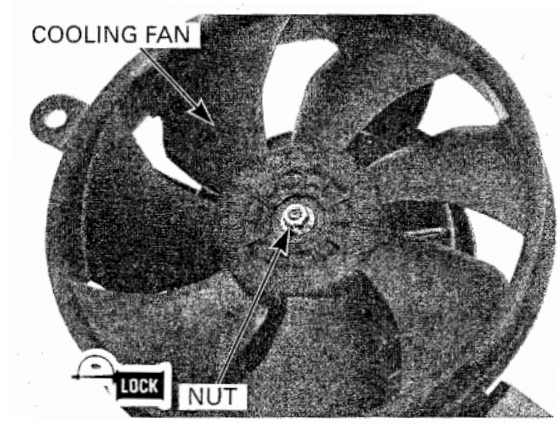


Install the distance collar onto the fan motor shaft. Install the cooling fan onto the fan motor shaft by aligning the flat surfaces.



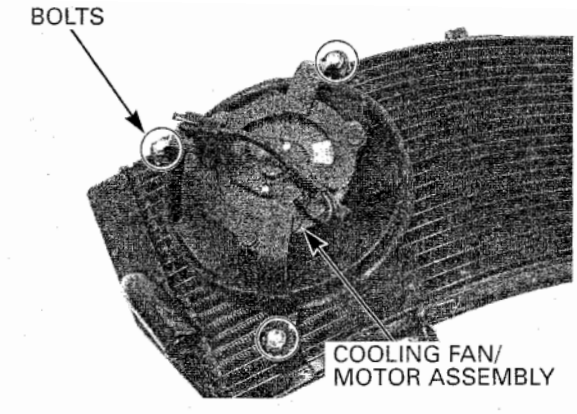
Apply a locking agent to the cooling fan nut threads. Install and tighten the nut to the specified torque.

TORQUE: 3 N•m (0.27 kgf•m, 2.0 lbf•ft)



Install the cooling fan/motor assembly onto the radiator. Install and tighten the bolts to the specified torque.

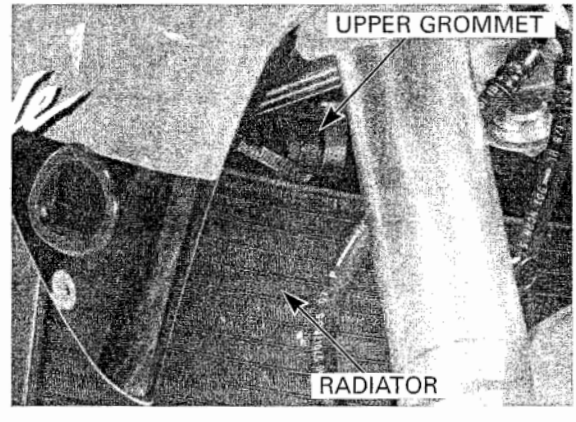
TORQUE: 8 N•m (0.8 kgf•m, 5.8 lbf•ft)



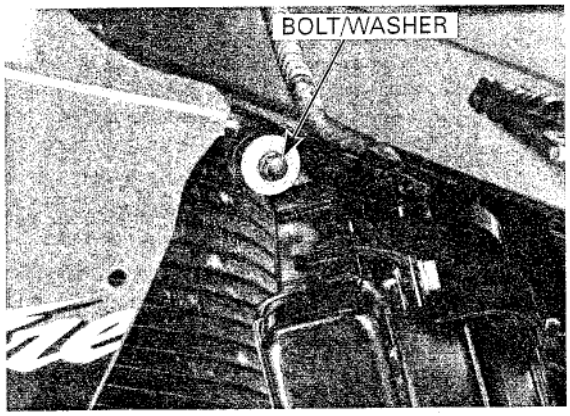
INSTALLATION

Be careful not to damage the radiator core.

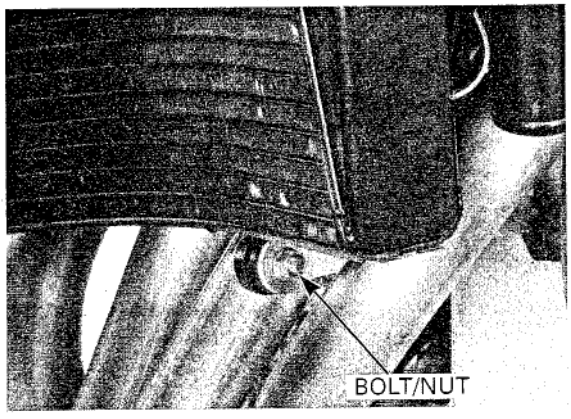
install the radiator assembly, aligning its grommet with the frame boss.



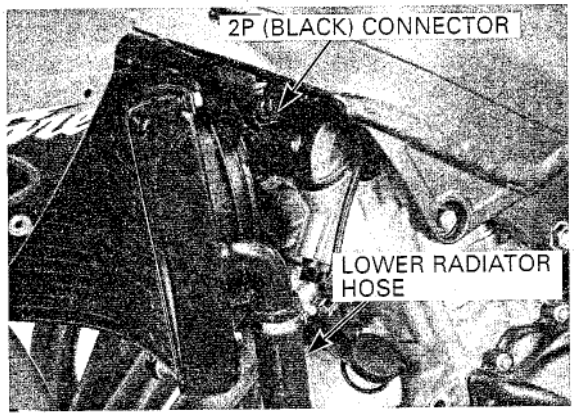
Install the washer and upper mounting bolt, then tighten the bolt.



Install the radiator lower mounting bolt/nut, tighten the nut securely.



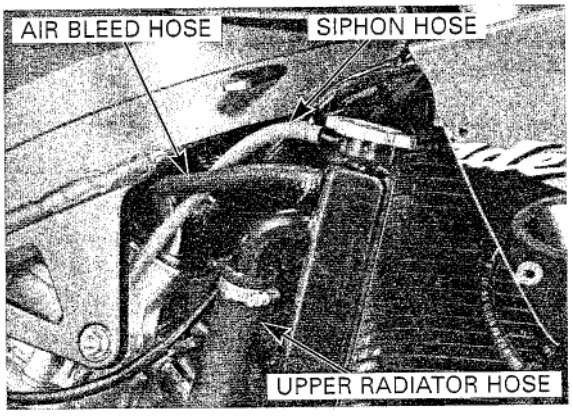
Connect the fan motor **2P** (Black) connector.
Connect the lower radiator hose and tighten the clamp screw securely.



Connect the upper radiator hose and tighten the clamp screw securely.
Connect the siphon hose and air bleed hose to the radiator.

Fill the system with the recommended coolant (page 6-5).

Install the following:
- Inner middle cowl (page 2-7)
- Lower cowl (page 2-7)

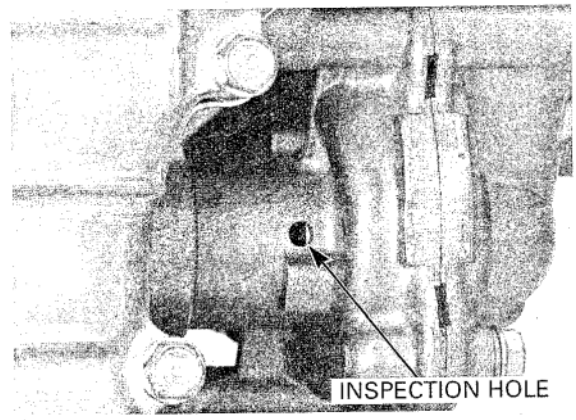


WATER PUMP

MECHANICAL SEAL INSPECTION

Remove the lower cowl (page 2-7).

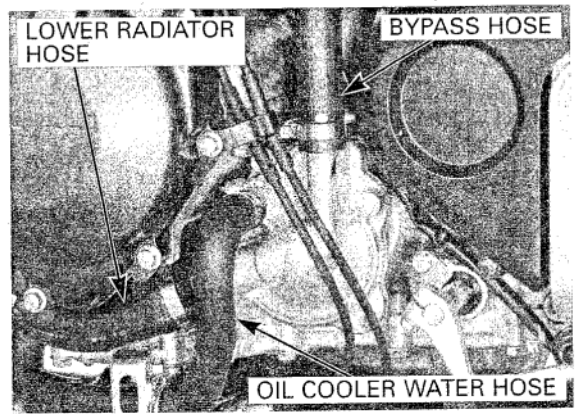
Inspect the inspection hole for signs of coolant leakage.
If there is leakage, the mechanical seal is defective and replace the water pump as an assembly.



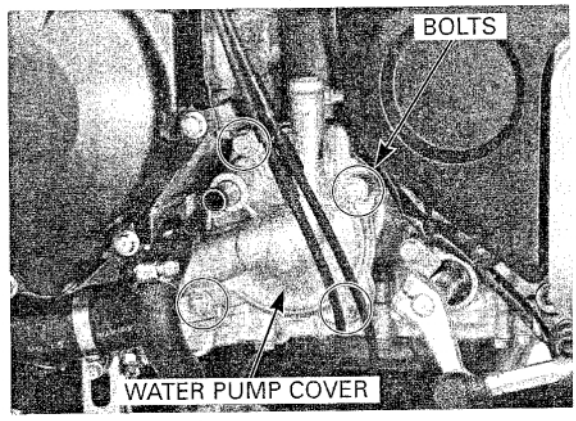
REMOVAL

Drain the coolant (page 6-4).

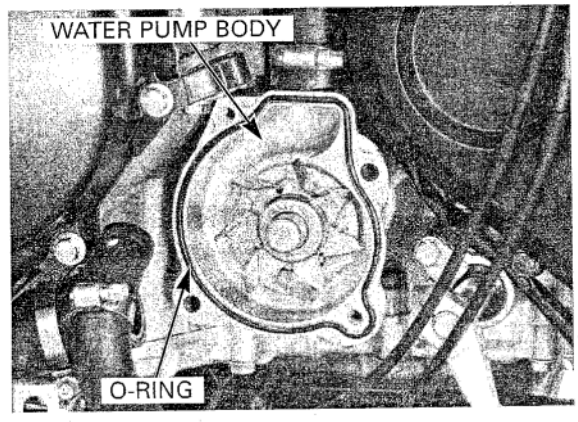
Disconnect the lower radiator hose, bypass hose and oil cooler water hose from the water pump cover.



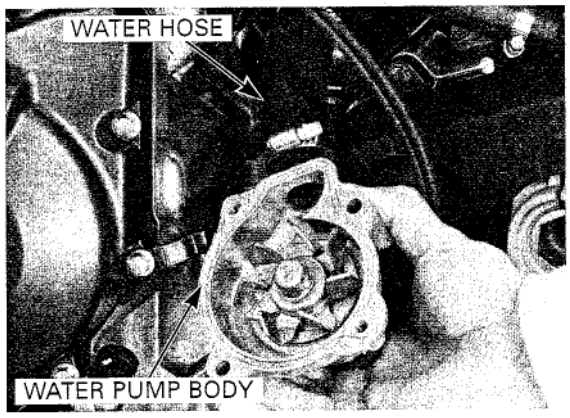
Remove the two SH bolts, two flange bolts and water pump cover.



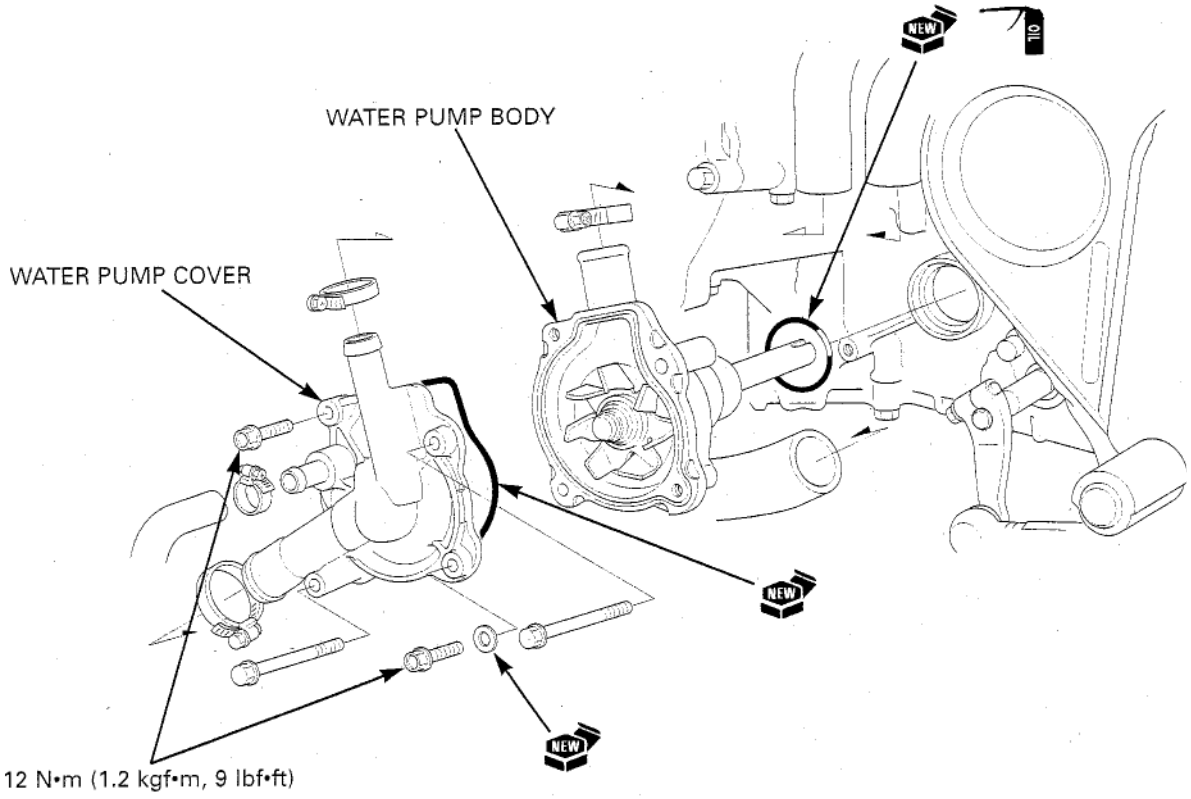
Remove the O-ring from the water pump body.
Remove the water pump body from the crankcase.



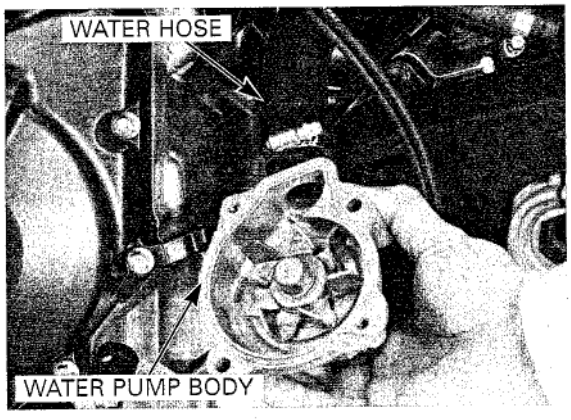
Disconnect the water pump-to-water joint hose from the water pump body.



INSTALLATION

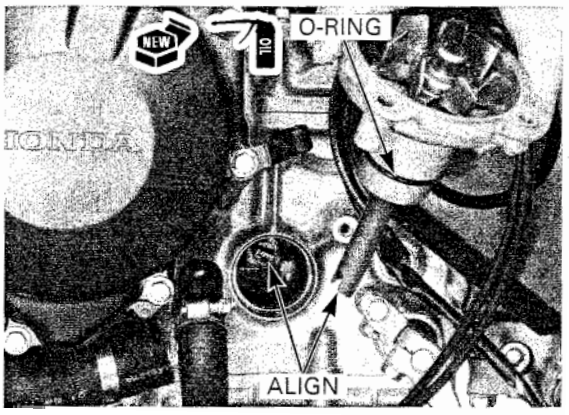


Connect the water pump-to-water joint hose to the water pump and tighten the clamp screw.



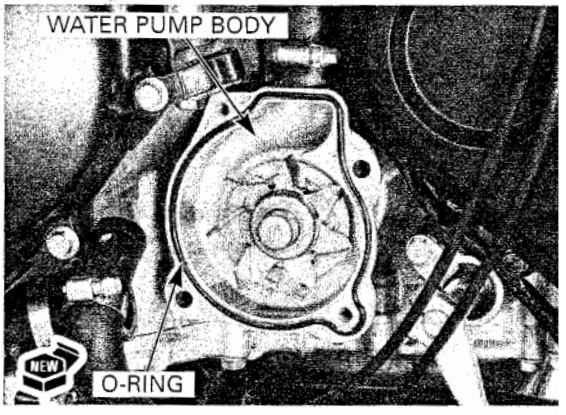
Apply engine oil to a new O-ring and install it onto the stepped portion of the water pump.

Install the water pump into the crankcase while aligning the water pump shaft groove with the oil pump shaft end.



Align the mounting bolt holes in the water pump and crankcase and make sure the water pump is securely installed.

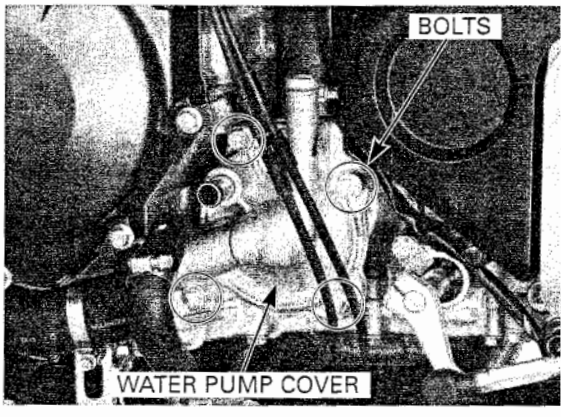
Install a new O-ring into the groove in the water pump body.



Install the water pump cover, two SH bolts and two flange bolts.
Tighten the flange bolts to the specified torque.

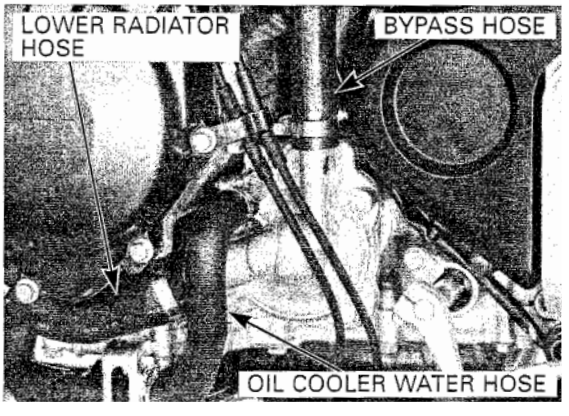
TORQUE: 12 N·m (1.2 kgf·m, 9 lbf·ft)

Tighten the two **SH** bolts.



Connect the lower radiator hose, bypass hose and oil cooler water hose, then tighten the clamp screws.

Fill the system with the recommended coolant (page 6-5).

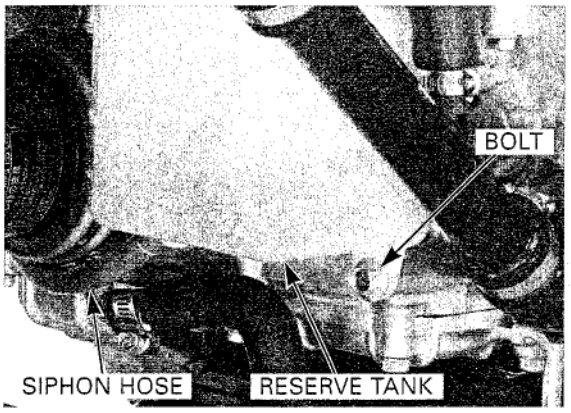


RADIATOR RESERVE TANK

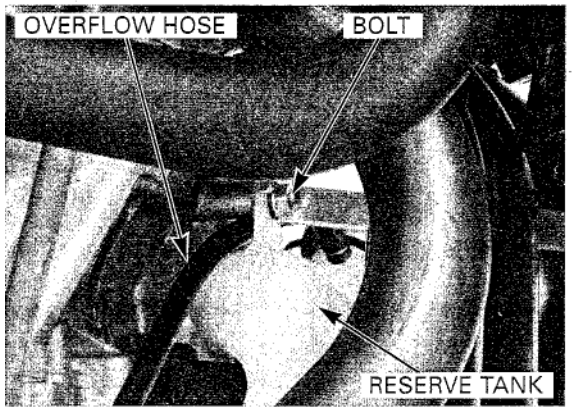
REMOVAL

Remove the lower cowl (page 2-7).

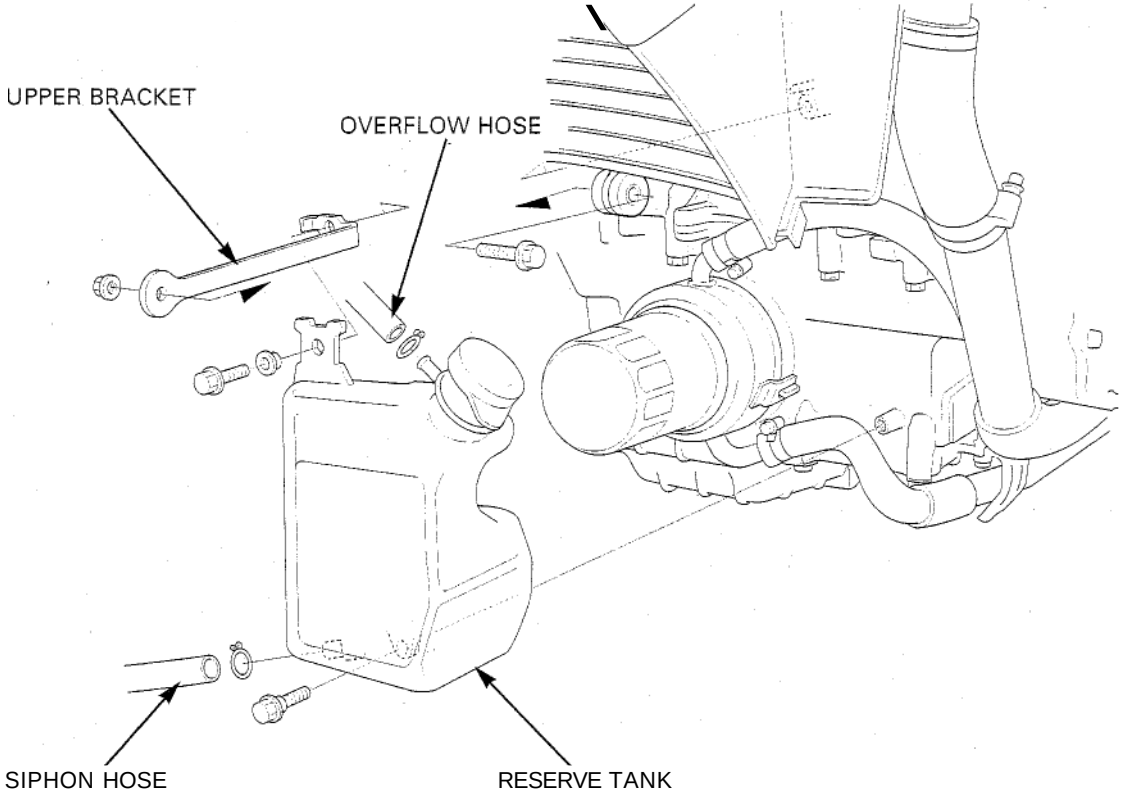
Disconnect the siphon hose and drain coolant from the reserve tank.
Remove the radiator reserve tank lower mounting bolt.



Remove the reserve tank upper mounting bolt and reserve tank.
Disconnect the overflow hose.

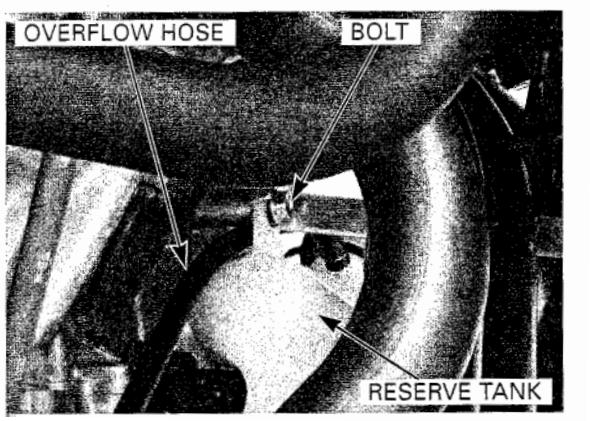


INSTALLATION



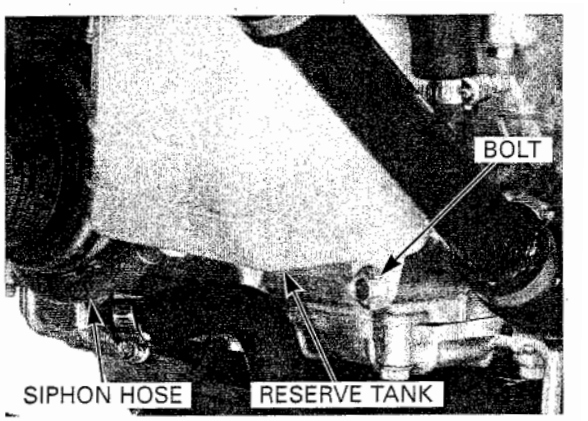
Route the overflow hose properly (page 1-29).

Install and tighten the reserve tank upper mounting bolt.



Install and tighten the lower mounting bolt.
Connect the siphon hose to the reserve tank

Install the removed parts in the reverse order of removal.

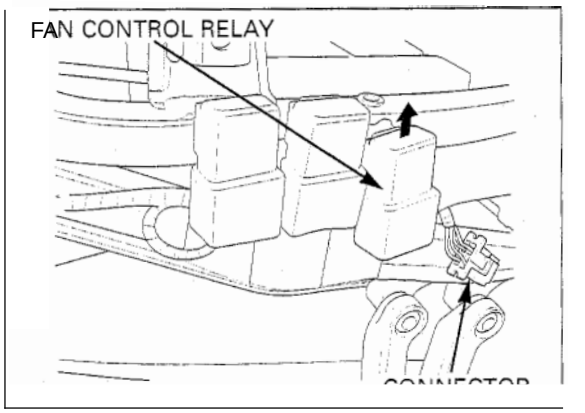


FAN CONTROL RELAY

INSPECTION

Remove the rear cowl (page 2-2).

Disconnect the fan control relay connector.
Remove the fan control relay.



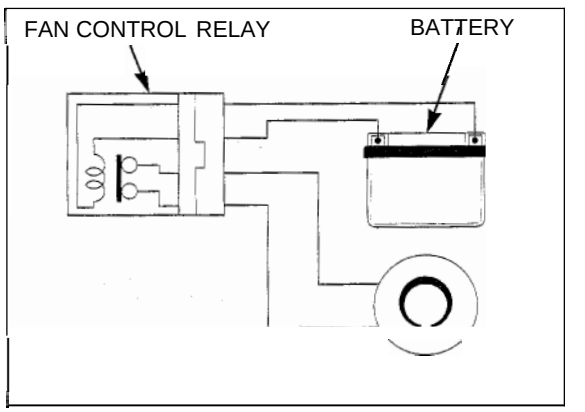
Connect the ohmmeter to the fan control relay connector terminals.

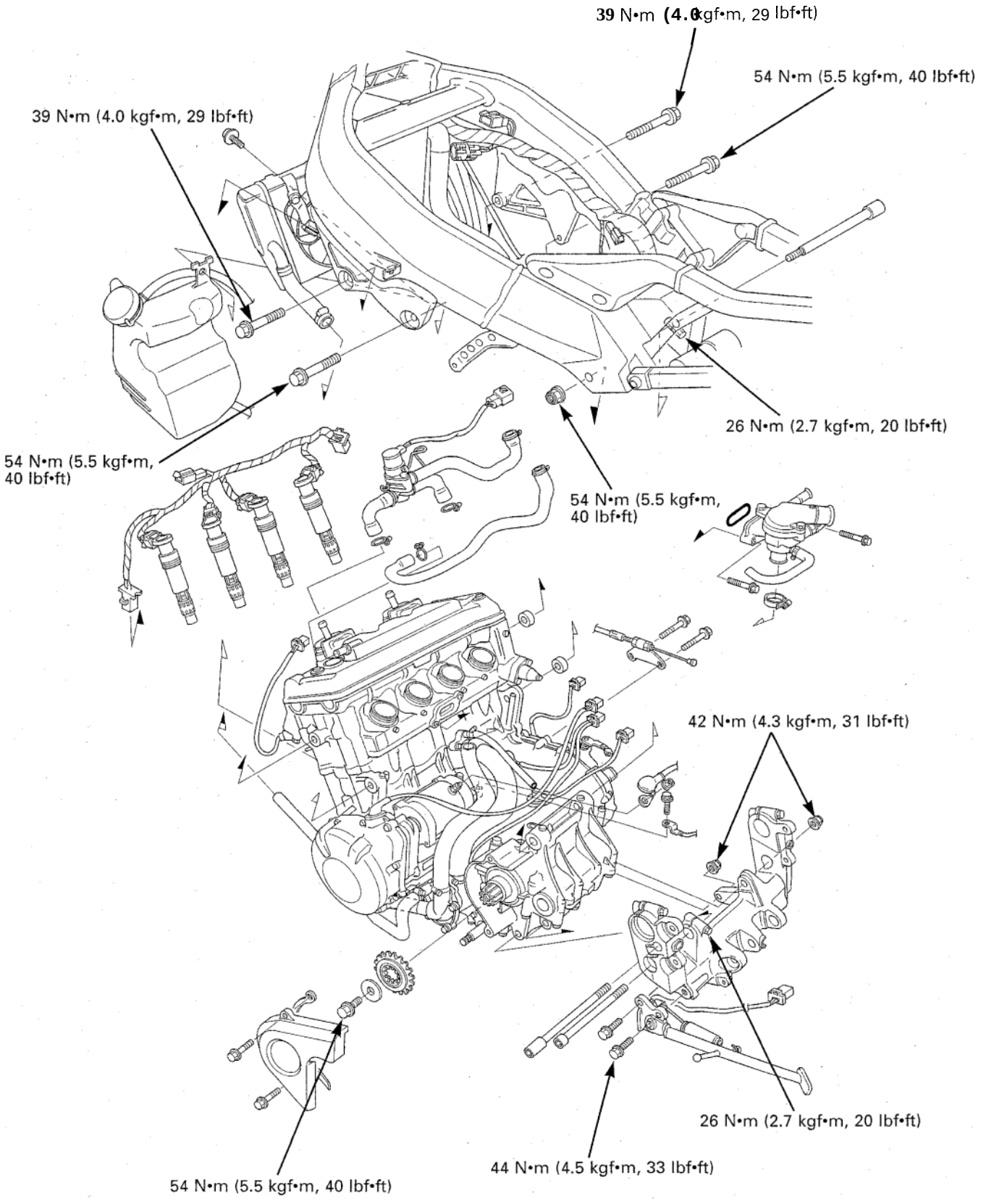
CONNECTION: Green/Yellow – Black/White

Connect the 12V battery to the following fan control relay connector terminals.

CONNECTION: Red/Green – Black/Blue

There should be continuity only when 12V battery is connected.
If there is no continuity when the 12V battery is connected, replace the fan control relay.




39 N•m (4.0 kgf•m, 29 lbf•ft)
54 N•m (5.5 kgf•m, 40 lbf•ft)
39 N•m (4.0 kgf•m, 29 lbf•ft)
26 N•m (2.7 kgf•m, 20 lbf•ft)
54 N•m (5.5 kgf•m, 40 lbf•ft)
54 N•m (5.5 kgf•m, 40 lbf•ft)
42 N•m (4.3 kgf•m, 31 lbf•ft)
26 N•m (2.7 kgf•m, 20 lbf•ft)
44 N•m (4.5 kgf•m, 33 lbf•ft)
54 N•m (5.5 kgf•m, 40 lbf•ft)

7. ENGINE REMOVAL/INSTALLATION

SERVICE INFORMATION	7-1	ENGINE INSTALLATION	7-7
LOWER BRACKET REMOVAL	7-2	LOWER BRACKET INSTALLATION	7-12
ENGINE REMOVAL	7-3		

SERVICE INFORMATION

GENERAL

- During engine removal and installation, support the motorcycle using a hoist or equivalent.
- Support the engine using a jack or other adjustable support to ease of engine hanger bolts removal.

NOTICE

Do not use *the oil filter as a jacking point.*

- The following components can be serviced with the engine installed in the frame.
  - Alternator (Section 10)
  - Camshaft (Section 8)
  - Clutch (Section 9)
  - Gearshift linkage (Section 9)
  - Oil cooler (Section 4)
  - Oil pump (Section 4)
  - Shift forks/shift drum (Section 9)
  - Water pump (Section 6)

ITEM		SPECIFICATIONS
Engine dry weight		61.2 kg (134.9 lbs)
Coolant capacity	Radiator and engine	3.1 liter (3.3 **US** qt, 2.7 Imp qt)
Engine oil capacity	At disassembly	4.0 liter (4.2 **US** qt, 3.5 Imp qt)

TORQUE VALUES

Lower bracket mounting nut, 10 mm	42 N•m (4.3 kgf-m, 31 lbf•ft)	U-nut, see page 7-12
Lower bracket mounting pinch bolt	26 N•m (2.7 kgf-m, 20 lbf•ft)	
Engine hanger bolt (front)	39 N•m (4.0 kgf•m, 29 lbf•ft)	See page 7-7
Engine hanger bolt (middle)	54 N•m (5.5 kgf-m, 40 lbf•ft)	
Engine hanger nut (rear)	54 N•m (5.5 kgf-m, 40 lbf•ft)	
Rear engine hanger pinch bolt	26 N•m (2.7 kgf•m, 20 lbf•ft)	
Swingarm pivot nut	118 N•m (12.0 kgf•m, 87 lbf•ft)	
Swingarm pivot pinch bolt	26 N•m (2.7 kgf•m, 20 lbf•ft)	
Side stand bracket bolt	44 N•m (4.5 kgf-m, 33 lbf•ft)	ALOC bolt
Drive sprocket special bolt	54 N•m (5.5 kgf•m, 40 lbf•ft)	

TOOL

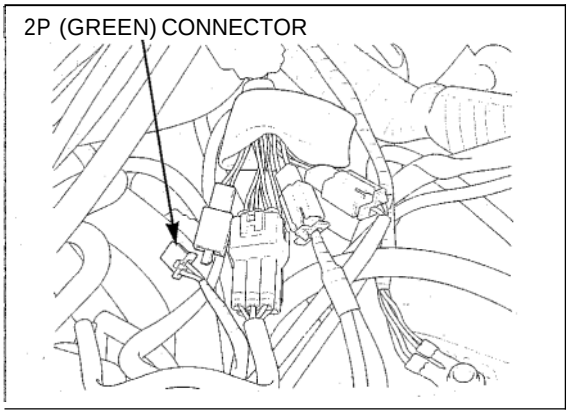
Rod holder, 24 x 27 mm	07930–KA50100

LOWER BRACKET REMOVAL

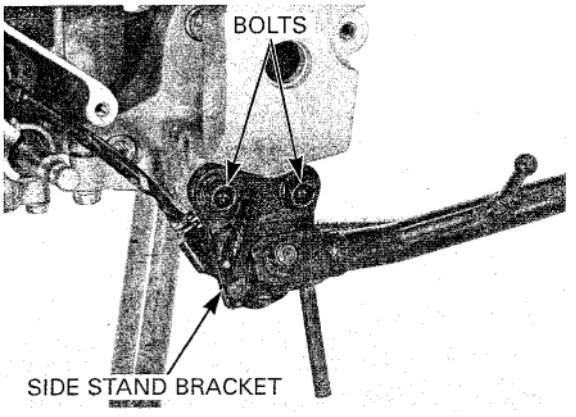
Open and support the front end of the fuel tank (page 3-4).

Remove the following:
- Muffler/exhaust pipe (page 2-13)
- Suspension linkage (page 14-9)
- Rear shock absorber (page 14-11)
- Swingarm (page 14-14)

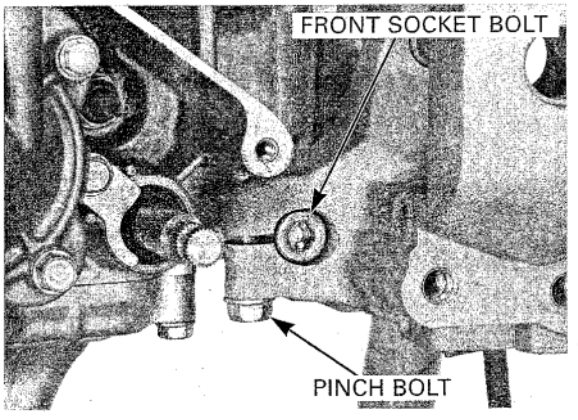
Disconnect the side stand 2P (Green) connector.



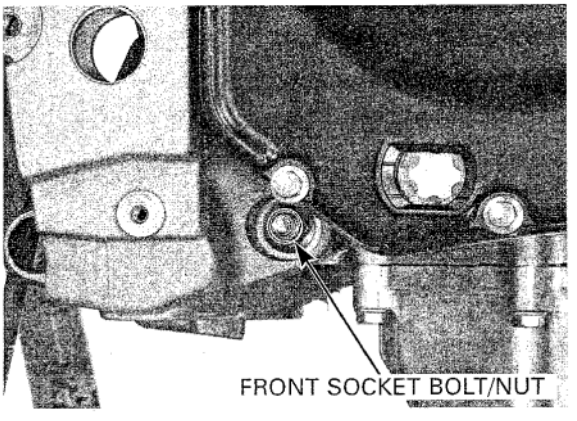
Remove the bolts and side stand bracket assembly.



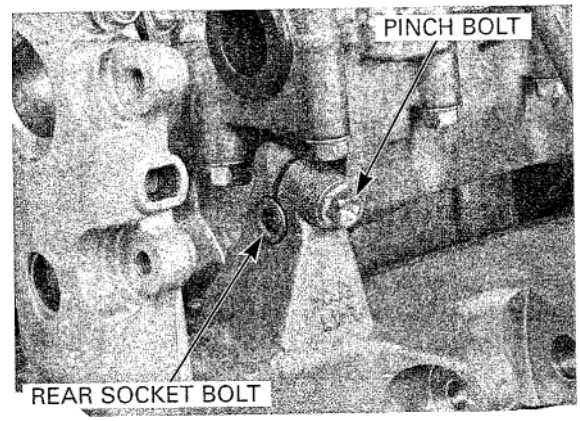
Loosen the lower bracket front pinch bolt.



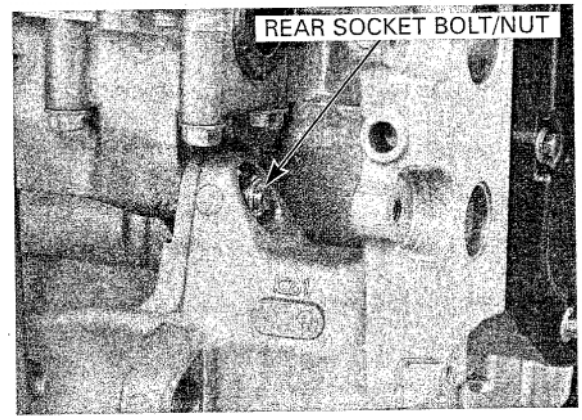
Remove the lower bracket front socket bolt and nut.



Loosen the lower bracket rear pinch bolt.



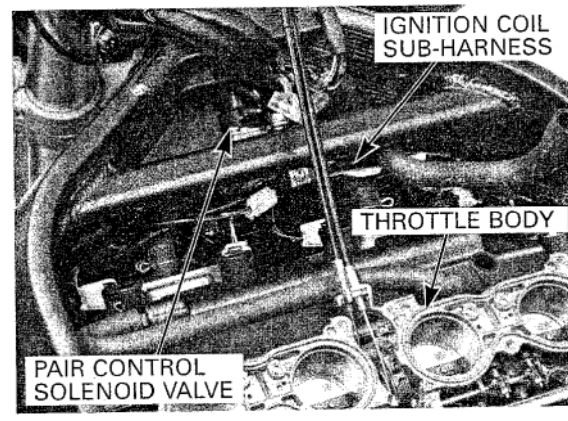
Remove the lower bracket rear socket bolt and nut, then remove the lower bracket from the engine.



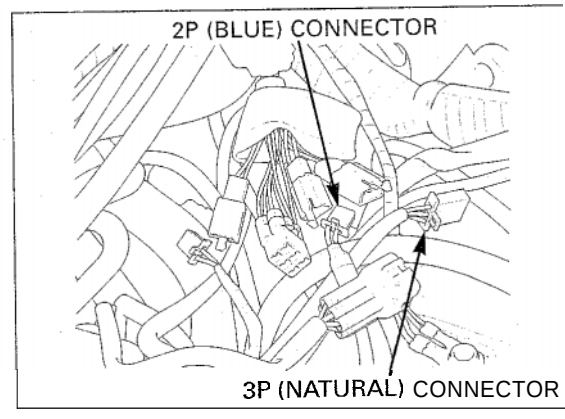
ENGINE REMOVAL

Drain the engine oil (page 3-15).
Drain the coolant (page 6-4).

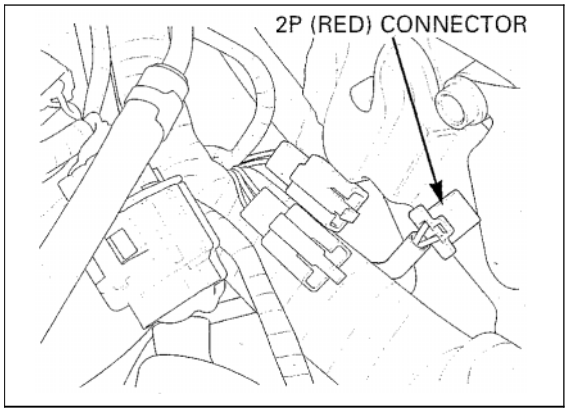
Remove the following:
- Fuel tank (page 5-59)
- EGCV and air intake valve servo motor (page 5-95)
- Throttle body (page 5-67)
- Lower bracket (page 7-2)
- PAIR control solenoid valve assembly (page 5-88)
- Ignition coil/spark plug sub-harness



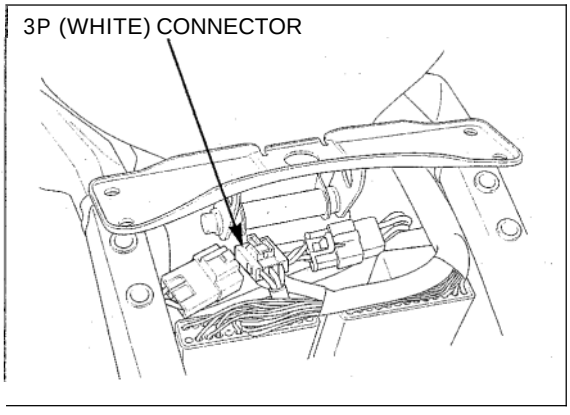
Disconnect the speed sensor **3P** (Natural) connector and engine sub-harness 2P (Blue) connector



Disconnect the Ignition pulse generator 2P (Red) connector.

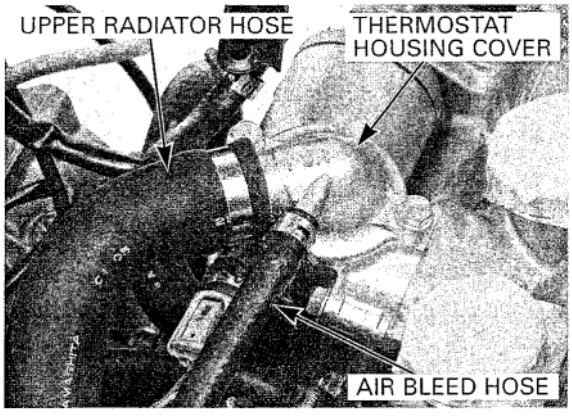


Disconnect the alternator 3P (White) connector.



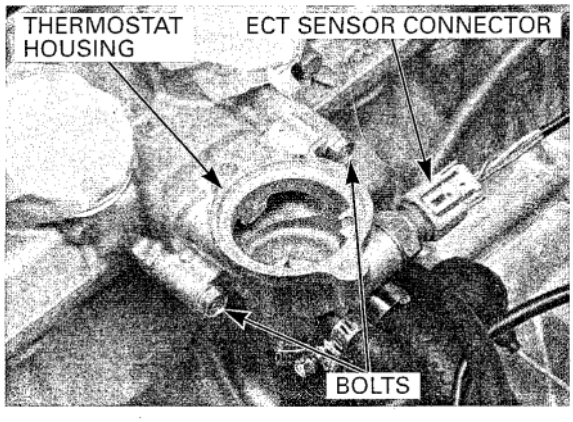
Disconnect the air bleed hose and upper radiator hose from the thermostat housing cover.

Remove the thermostat housing cover and thermostat (page 6-6).

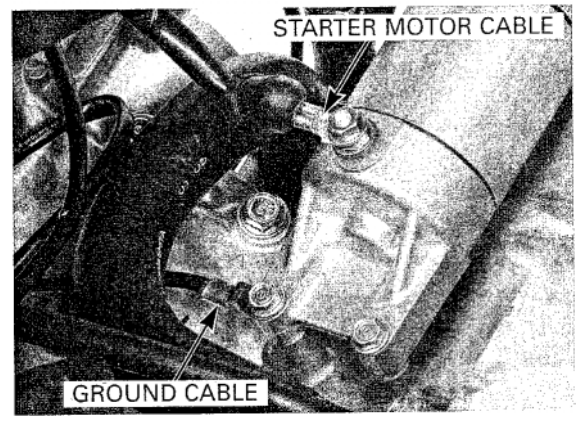


Disconnect the ECT sensor connector.

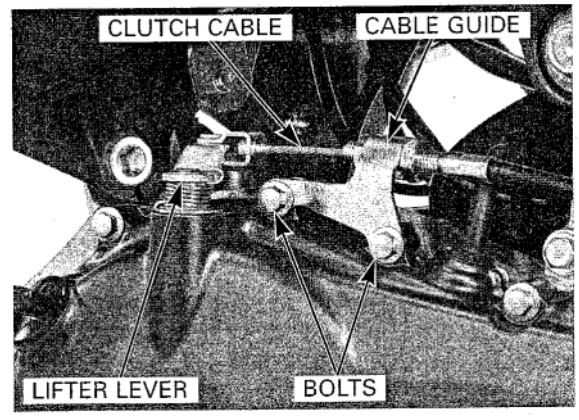
Remove the bolts and thermostat housing from the cylinder head.



Remove the starter motor mounting bolt and starter motor ground cable.
Remove the terminal nut and starter motor cable.

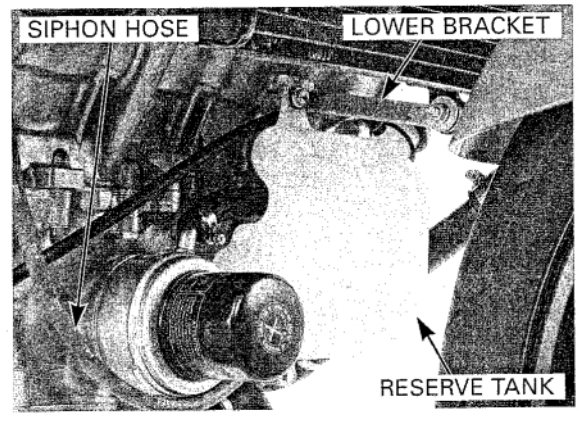


Remove the bolts and clutch cable guide, then disconnect the clutch cable from the clutch lifter lever.

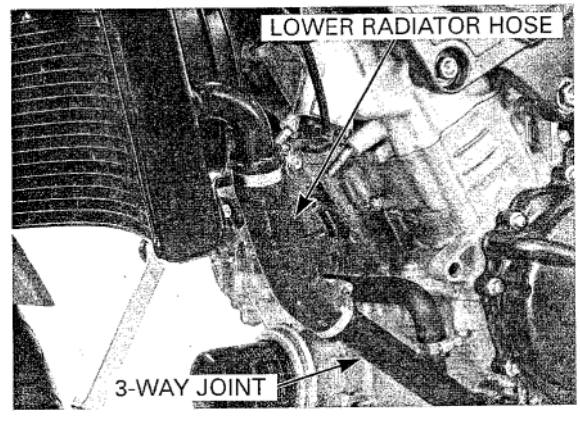


Remove the radiator lower mounting bracket bolt/nut.

Disconnect the siphon hose from the radiator reserve tank.
Remove the bolts, radiator reserve tank and radiator lower mounting bracket.

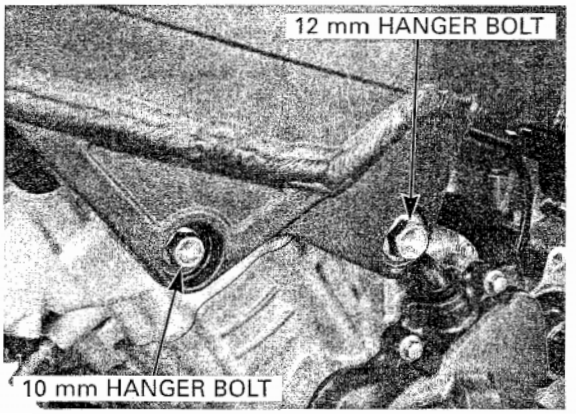


Disconnect the lower radiator hose from the radiator hose three-way joint.

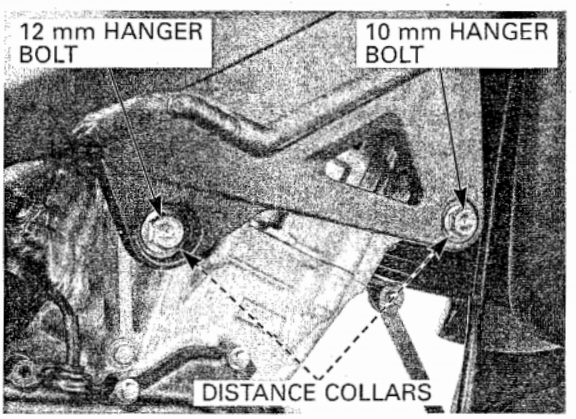


Support the engine using a jack or other adjustable support to ease of engine hanger bolts removal.

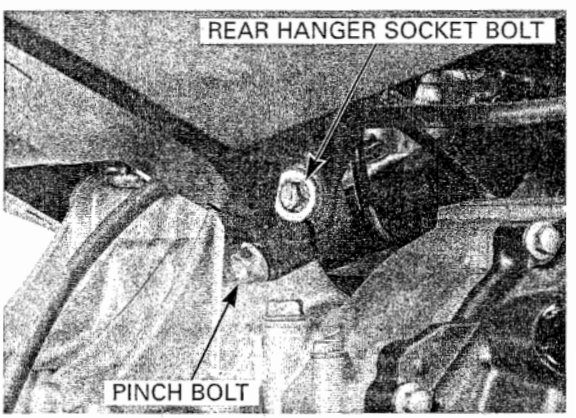
Remove left side of the front (10 mm) and middle (12 mm) engine hanger bolts.



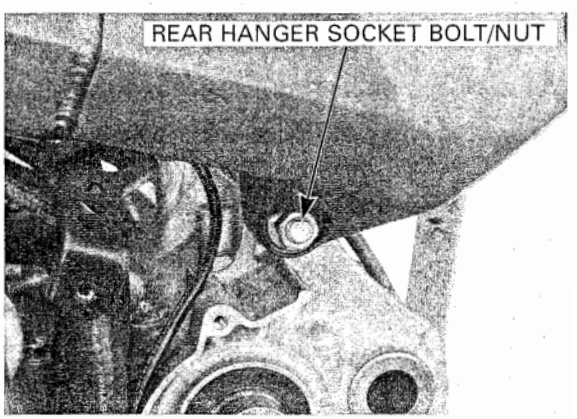
Remove the right side of the front (10 mm) and middle (12 mm) engine hanger bolts and distance collars.



Loosen the rear engine hanger pinch bolt.

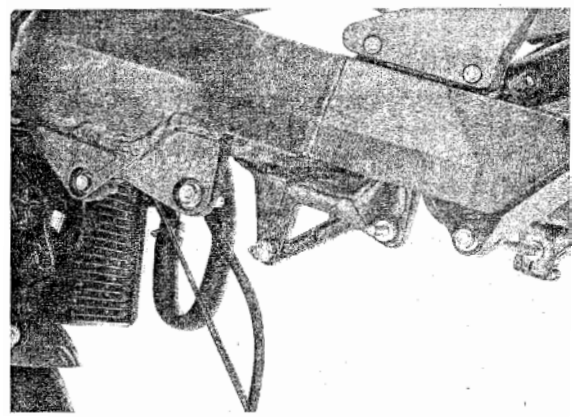


Remove the rear engine hanger socket bolt and nut, then remove the engine from the frame.



ENGINE INSTALLATION

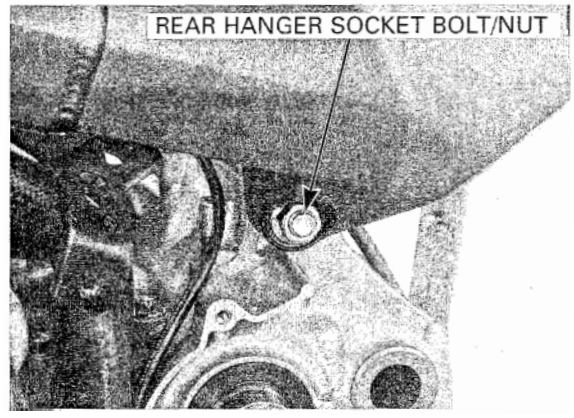
- Note the direction of the hanger bolts.
- Use a floor jack or other adjustable support to carefully maneuver the engine into place.



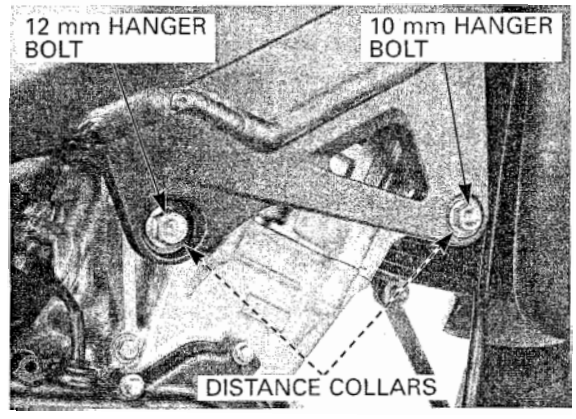
Be careful not to damage the cam chain tensioner lifter

Install the engine into the frame.

Install the rear engine hanger socket bolt and nut.



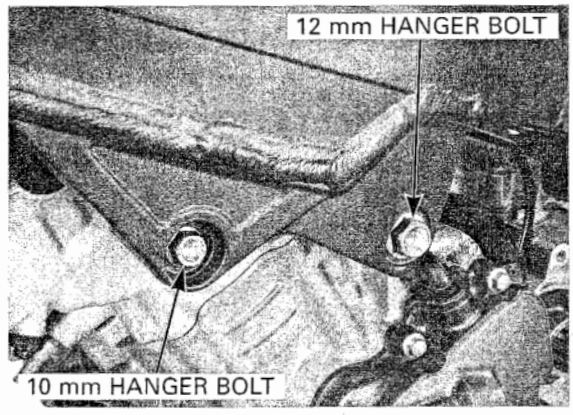
Install the right side of the front (10 mm) and middle (12 mm) engine hanger bolts with the distance collars.



Install the left side of the front (10 mm) and middle (12 mm) engine hanger bolts.

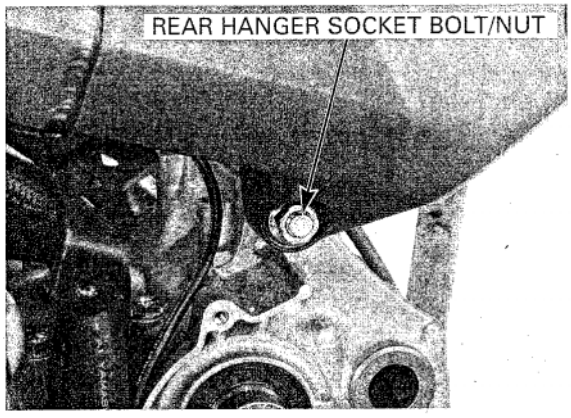
NOTICE

Install the right and left front engine hanger bolts in their proper locations. Improper installation will damage the cylinder head.



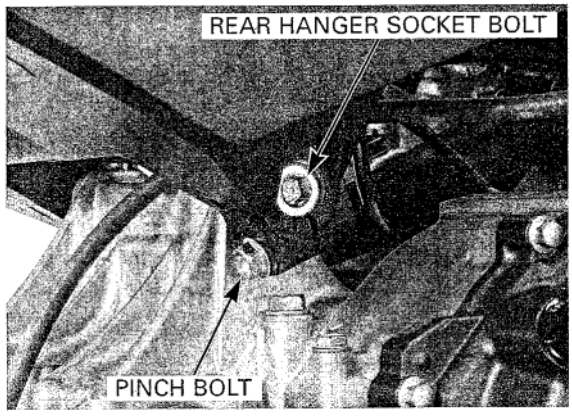
Hold the rear engine hanger socket bolt, then tighten the nut to the specified torque.

TORQUE: 54 N•m (5.5 kgf-m, 40 lbf•ft)



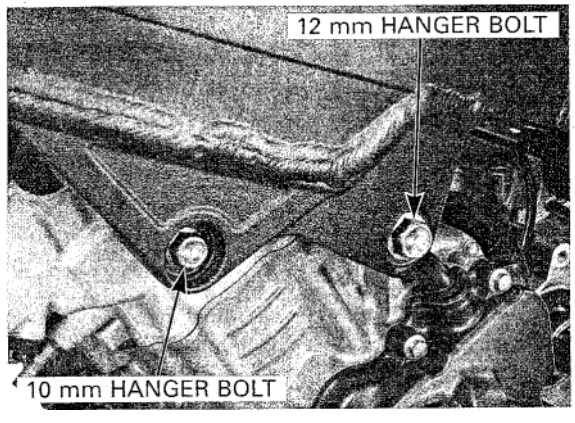
Tighten the rear engine hanger pinch bolt to the specified torque.

TORQUE: 26 N•m (2.7 kgf•m, 20 lbf•ft)



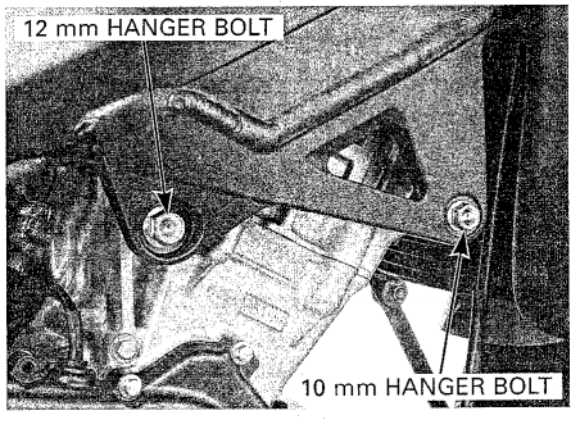
Tighten the left side of the front (10 mm) and middle (12 mm) engine hanger bolt to the specified torque.

TORQUE:
Front (10 mm): 39 N•m (4.0 kgf•m, 29 lbf•ft)
Middle (12 mm): 54 N•m (5.5 kgf-m, 40 lbf•ft)

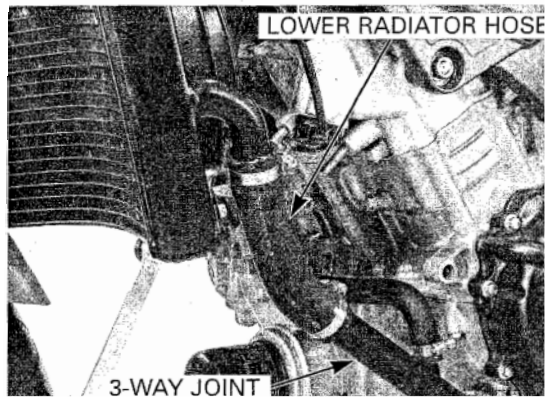


Tighten the right side of the front (10 mm) and middle (12 mm) engine hanger bolt to the specified torque.

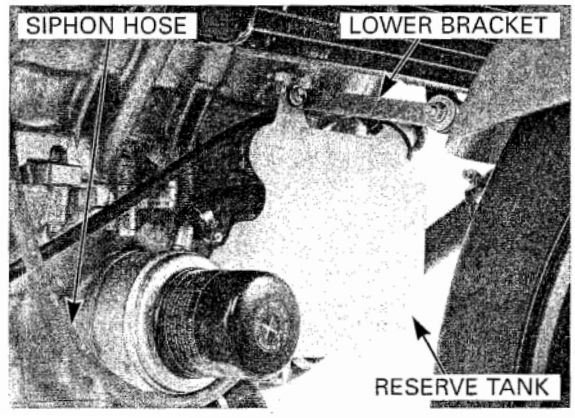
TORQUE:
Front (10 mrn): 39 N•m (4.0 kgf-m, 29 lbf•ft)
Middle (12 mm): 54 N•m (5.5 kgf-m, 40 lbf•ft)



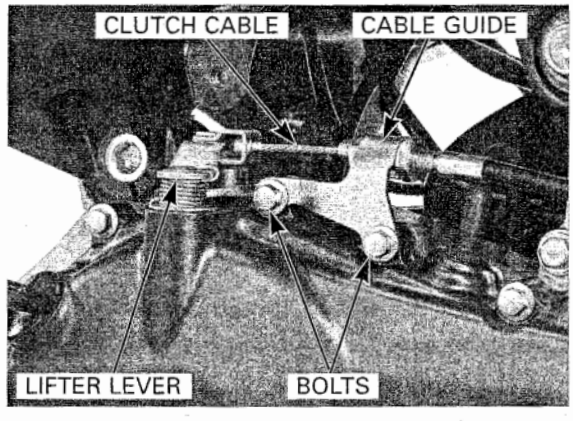
Connect the lower radiator hose to the radiator hose three-way joint and tighten the hose band screw.



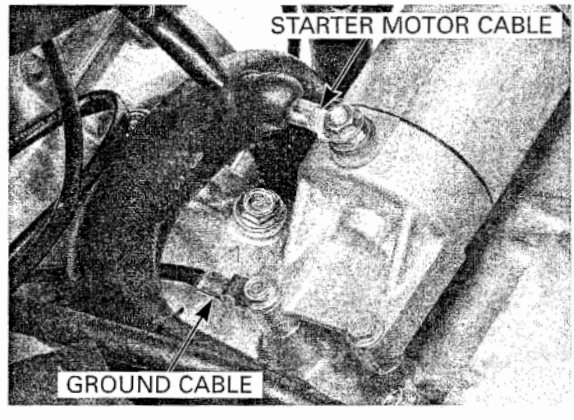
Install the radiator reserve tank and mounting bolts, then tighten the bolts.
Connect the siphon hose to the reserve tank.
Install the radiator lower mounting bolt/nut, then tighten the nut securely.



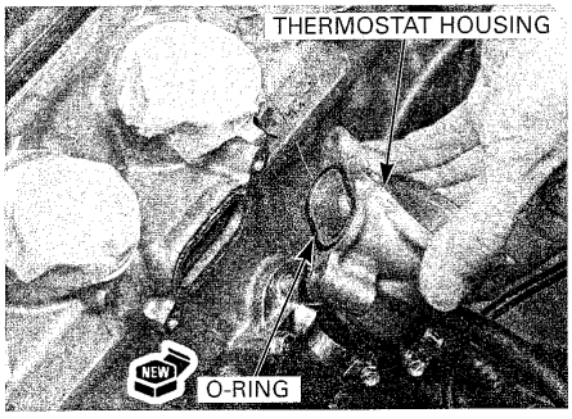
Connect the clutch cable end to the clutch lifter lever.
Install the clutch cable guide to the right crankcase cover and tighten the mounting bolts securely.



Connect the starter motor ground cable.
Install and tighten the starter motor mounting bolt.
Connect the starter motor cable to the motor terminal.
Install and tighten the terminal nut.

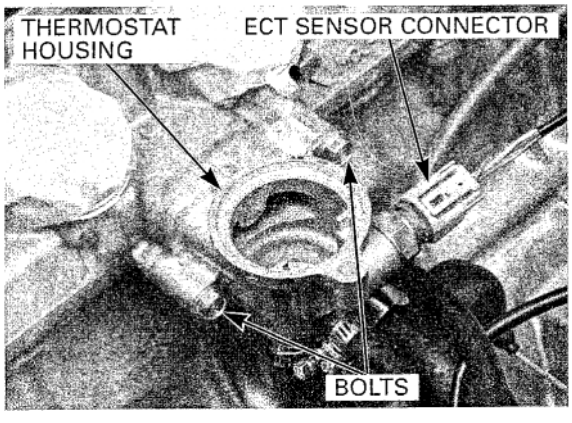


install a new O-ring into the thermostat housing groove.
Install the thermostat housing to the cylinder head.



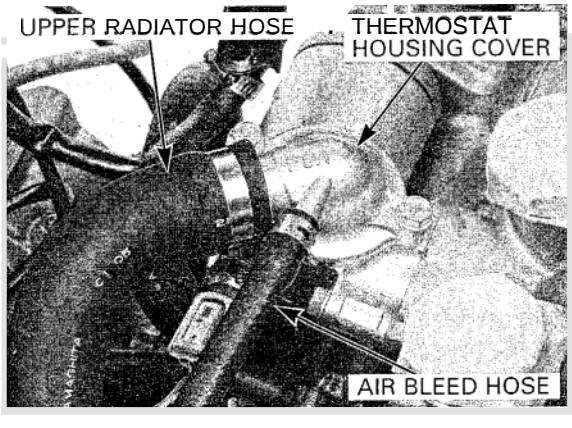
Install and tighten the thermostat housing mounting bolts.

Connect the ECT sensor connector.

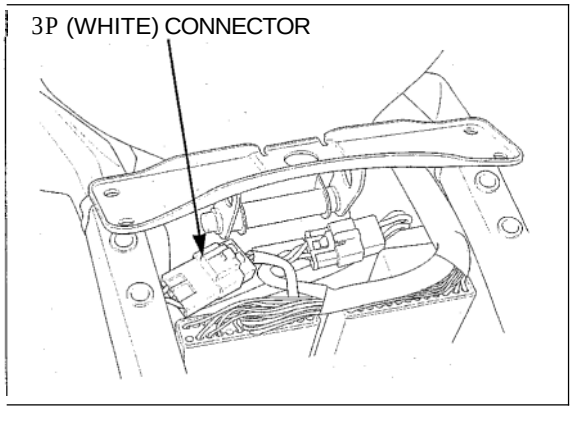


Install the thermostat and thermostat housing cover (page 6-7).

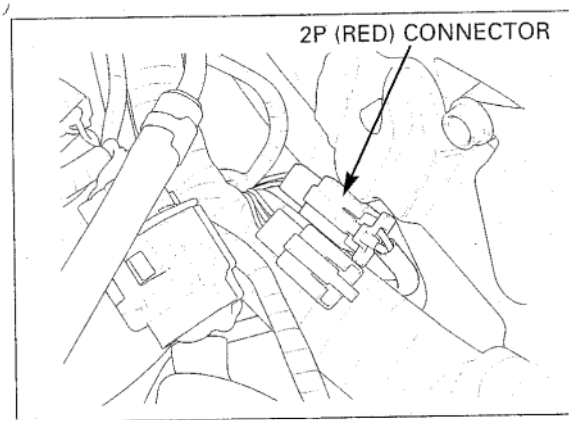
Connect the air bleed hose and upper radiator hose to the thermostat housing cover and tighten the hose band screw.



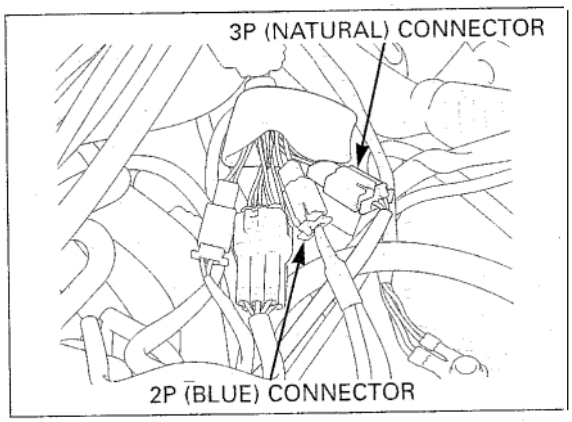
Route the alternator wire and connect the alternator **3P** (White) connector.



Connect the ignition pulse generator 2P (Red) connector.

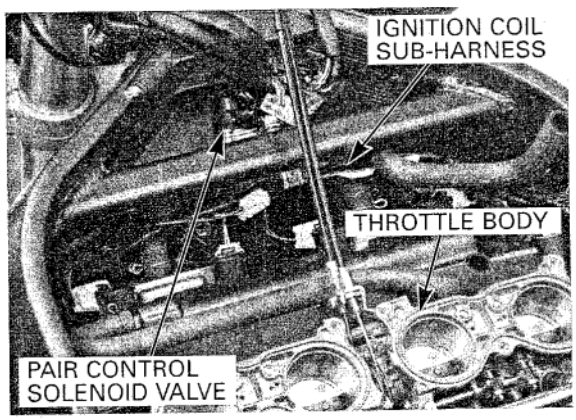


Connect the speed sensor 3P (Natural) connector and engine sub-harness 2P (Blue) connector

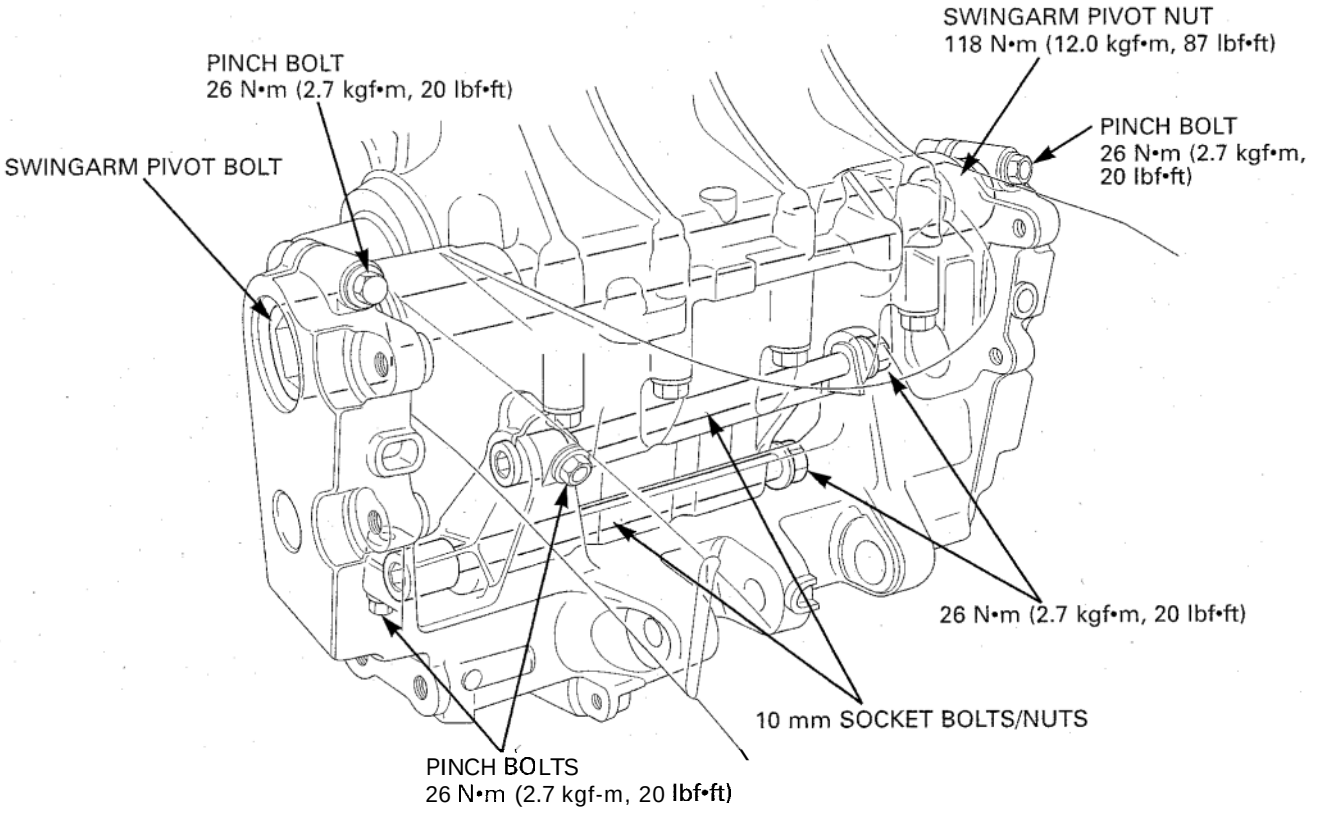


Install the following:
- Ignition coil/spark plug sub-harness
- PAIR control solenoid valve assembly (page 5-88)
- Lower bracket (page 7-12)
- Throttle body (page 5-71)
- EGCV and air intake valve servo motor (page 5-96)
- Fuel tank (page 5-61)

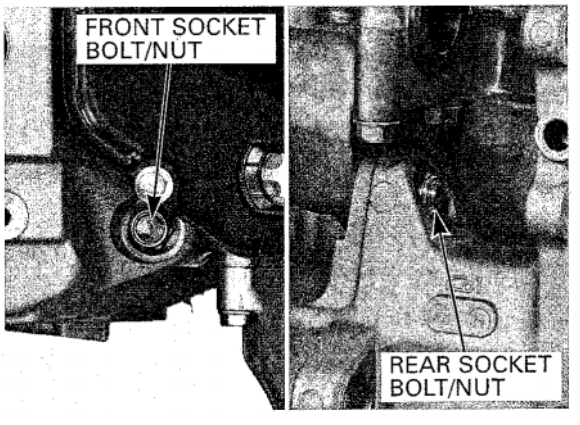
Add the recommended engine oil to the proper level (page 3-16).
Fill the cooling system with the recommended coolant and bleed any air (page 6-5).



LOWER BRACKET INSTALLATION



Install the lower bracket onto the engine.
Temporarily install the front and rear 10 mm bolts and nuts.
Temporarily tighten the 10 mm nuts.



Install the swingarm (page 14-23).

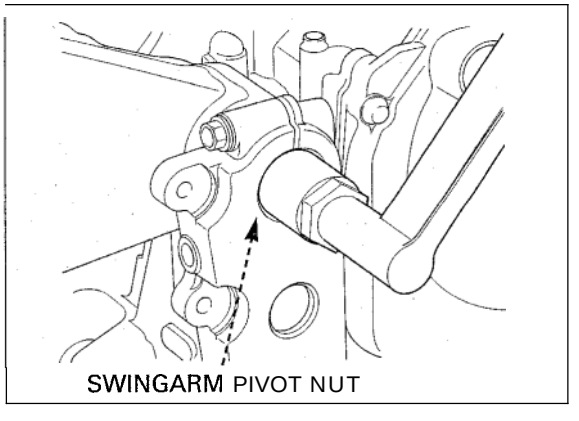
Hold the swingarm pivot bolt using the special tool, then tighten the pivot nut to the specified torque.

TOOL
Rod holder, 24 x 27 mm **07930-KA50100**

TORQUE: 118 N•m (12.0 kgf-m, 87 lbf•ft)

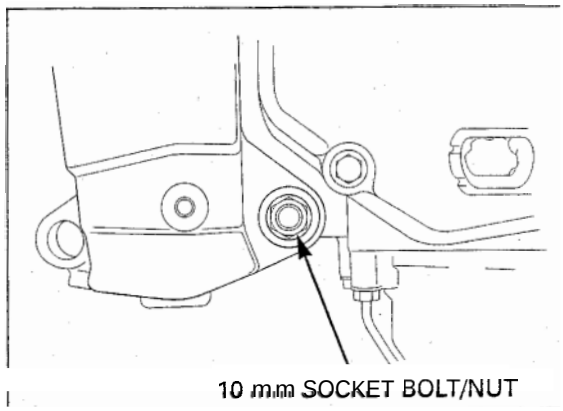
Tighten the swingarm pivot pinch bolt to the specified torque.

TORQUE: 26 N•m (2.7 kgf-m, 20 lbf•ft)



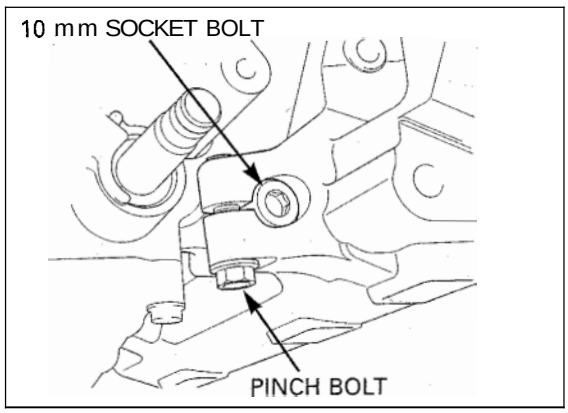
Tighten the front 10 mm socket bolt and nut to the specified torque.

TORQUE: 42 N•m (4.3 kgf-m, 31 lbf•ft)



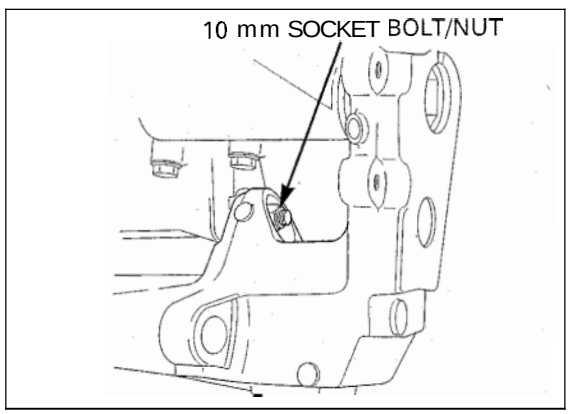
Tighten the front pinch bolt to the specified torque.

TORQUE: 26 N•m (2.7 kgf-m, 20 lbf•ft)



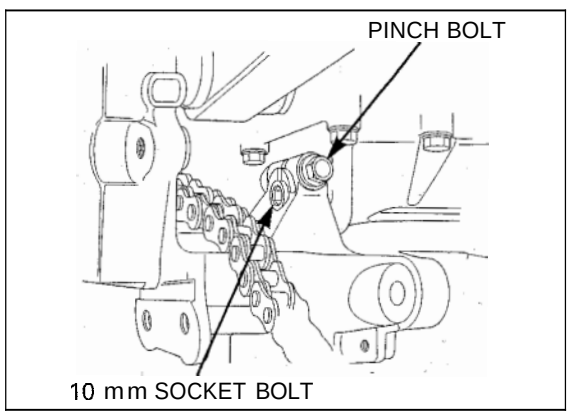
Hold the rear 10 mm socket bolt and tighten the nut to the specified torque.

TORQUE: 42 N•m (4.3 kgf-m, 31 lbf•ft)



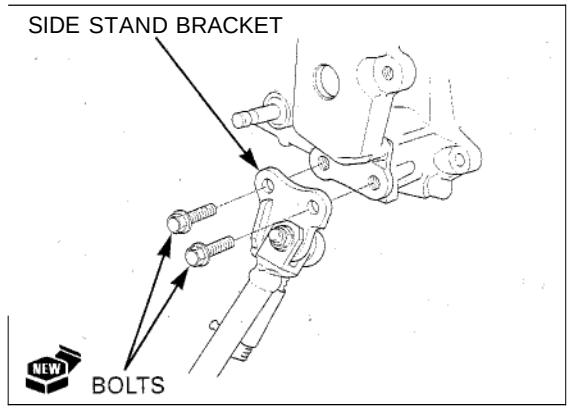
Tighten the rear pinch bolt to the specified torque.

TORQUE: 26 N•m (2.7 kgf-m, 20 lbf•ft)



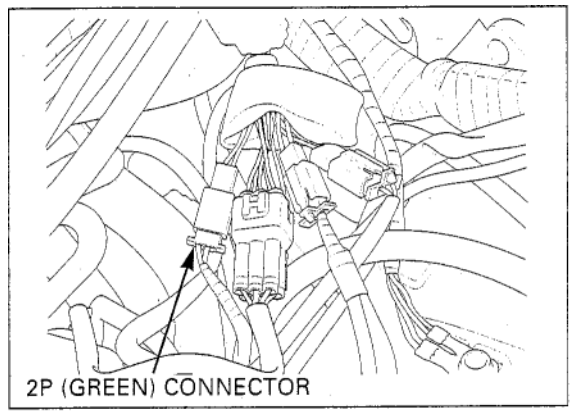
Install the side stand bracket assembly, tighten the new bolts to the specified torque.

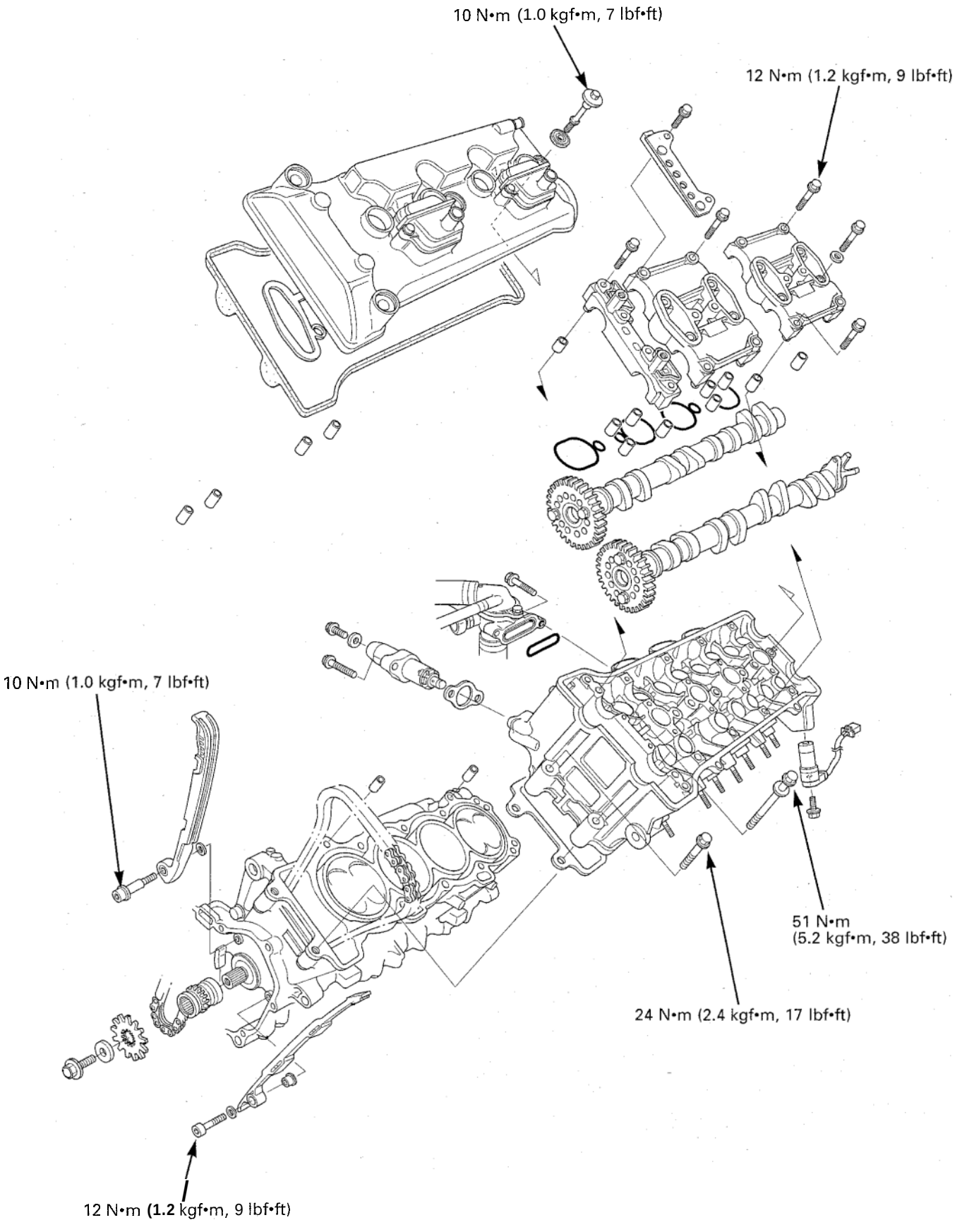
TORQUE: 44 N•m (4.5 kgf•m, 33 lbf•ft)



Route the side stand wire properly, connect the side stand switch 2P (Green) connector.

Install the following:
- Rear shock absorber (page 14-13)
- Suspension linkage (page 14-11)
- Muffler/exhaust pipe (page 2-16)




10 N•m (1.0 kgf•m, 7 lbf•ft)
12 N•m (1.2 kgf•m, 9 lbf•ft)
10 N•m (1.0 kgf•m, 7 lbf•ft)
51 N•m
(5.2 kgf•m, 38 lbf•ft)
24 N•m (2.4 kgf•m, 17 lbf•ft)
12 N•m (1.2 kgf•m, 9 lbf•ft)

8. CYLINDER HEAD/VALVES

SERVICE INFORMATION	8-1	VALVE GUIDE REPLACEMENT	8-17
TROUBLESHOOTING	8-3	VALVE SEAT INSPECTION/ REFACING	8-18
CYLINDER COMPRESSION TEST	8-4	CYLINDER HEAD ASSEMBLY	8-20
CYLINDER HEAD COVER REMOVAL	8-5	CYLINDER HEAD INSTALLATION	8-22
CYLINDER HEAD COVER DISASSEMBLY	8-6	CAMSHAFT INSTALLATION	8-24
CAMSHAFT REMOVAL	8-7	CYLINDER HEAD COVER ASSEMBLY	8-29
CYLINDER HEAD REMOVAL	8-12	CYLINDER HEAD COVER INSTALLATION	8-30
CYLINDER HEAD DISASSEMBLY	8-13	CAM CHAIN TENSIONER LIFTER	8-32
CYLINDER HEAD INSPECTION	8-14		

SERVICE INFORMATION

8

GENERAL

- This section covers service of the cylinder head, valves and camshaft.
- The camshaft services can be done with the engine installed in the frame. The cylinder head service required engine removal.
- When disassembling, mark and store the disassembled parts to ensure that they are reinstalled in their original locations.
- Clean all disassembled parts with cleaning solvent and dry them by blowing them off with compressed air before inspection.
- Camshaft lubricating oil is fed through oil passages in the cylinder head. Clean the oil passages before assembling the cylinder head.
- Be careful not to damage the mating surfaces when removing the cylinder head cover and cylinder head.

SPECIFICATIONS

Unit: mm (in)

ITEM			STANDARD	SERVICE LIMIT
Cylinder compression			1,196 kPa (12.2 kgf/cm², 174 psi) at 350 rpm	—
Valve clearance		IN	0.16 ± 0.03 (0.006 ± 0.001)	—
		EX	0.27 ± 0.03 (0.011 ± 0.001)	—
Cam shaft	Cam lobe height	IN	36.74 – 36.98 (1.446 – 1.456)	36.72 (1.446)
		EX	36.45 – 36.69 (1.435 – 1.444)	36.43 (1.434)
	Runout		—	0.04 (0.002)
	Oil clearance		0.020 – 0.062 (0.0008 – 0.0024)	0.10 (0.004)
Valve lifter	Valve lifter O.D.	IN/EX	25.978 – 25.993 (1.0228 – 1.0233)	25.97 (1.022)
	Valve lifter bore I.D.	IN/EX	26.010 – 26.026 (1.0240 – 1.0246)	26.04 (1.025)
Valve, valve guide	Valve stem O.D.	IN	4.475 – 4.490 (0.1762 – 0.1768)	4.465 (0.1758)
		EX	4.465 – 4.480 (0.1758 – 0.1764)	4.455 (0.1754)
	Valve guide I.D.	IN/EX	4.500 – 4.512 (0.1722 – 0.1776)	4.540 (0.1787)
	Stem-to-guide clearance	IN	0.010 – 0.037 (0.0004 – 0.0015)	—
		EX	0.020 – 0.047 (0.0008 – 0.0019)	—
	Valve guide projection above cylinder head	IN	14.3 – 14.6 (0.56 – 0.57)	—
		EX	12.4 – 12.7 (0.49 – 0.50)	—
	Valve seat width	IN/EX	0.90 – 1.10 (0.035 – 0.043)	1.5 (0.06)
Valve spring free length	IN	Inner	34.80 (1.370)	33.1 (1.30)
		Outer	37.97 (1.495)	36.1 (1.42)
	EX		39.60 (1.559)	37.6 (1.48)
Cylinder head warpage			—	0.10 (0.004)

TORQUE VALUES

Cylinder head cover bolt	10 N•m (1.0 kgf-m, 7 lbf•ft)	
PAIR reed valve cover flange bolt	12 N•m (1.2 kgf•m, 9 lbf•ft)	Apply a locking agent to the threads
Breather plate flange bolt	12 N•m (1.2 kgf•m, 9 lbf•ft)	Apply a locking agent to the threads
Camshaft holder flange bolt	12 N•m (1.2 kgf-m, 9 lbf•ft)	Apply oil to the threads
Cylinder head sealing bolt	27 N•m (2.8 kgf•m, 20 lbf•ft)	Apply a locking agent to the threads
Cylinder head mounting bolt	51 N•m (5.2 kgf•m, 38 lbf•ft)	Apply molybdenum disulfide oil to the threads and seating surface (after removing anti-rust oil additive)
Cylinder head mounting bolt, 8 mm	24 N•m (2.4 kgf-m, 17 lbf•ft)	Apply oil to the threads
Cam sprocket bolt	20 N•m (2.0 kgf•m, 14 lbf•ft)	Apply a locking agent to the threads
Cam pulse generator rotor dowel bolt	12 N•m (1.2 kgf•m, 9 lbf•ft)	Apply a locking agent to the threads
Cam chain tensioner pivot socket bolt	10 N•m (1.0 kgf-m, 7 lbf•ft)	Apply a locking agent to the threads
Cam chain guide mounting socket bolt	12 N•m (7.2 kgf•m, 9 lbf•ft)	Apply a locking agent to the threads
Cylinder head stud bolt (exhaust pipe stud bolt)	See page 1-14	
Throttle cable guide bracket mounting bolt	3 N•m (0.3 kgf-m, 2.2 lbf•ft)	

TOOLS

Compression gauge attachment	07RMJ–MY50100	or equivalent commercially available in U.S.A.
Valve spring compressor	07757--0010000	
Valve spring compressor attachment	07959–KM30101	
Tappet hole protector	07HMG–MR70002	not available in U.S.A. or refer to page 8-13 for alternative tool (U.S.A. only)
Valve guide driver, 4.5 mm	07HMD–MLOO101	
Valve guide reamer, 4.5 mm	07HMH–ML00101	or 07HMH–ML001OA (U.S.A. only)
Valve seat cutters		
Seat cutter, 24.5 mm (45" EX)	07780–0010100	equivalent commercially available in U.S.A.
Seat cutter, 29 rnm (45" IN)	07780–0010300	
Flat cutter, 28 mm (32" EX)	07780–0012100	
Flat cutter, 30 mm (32" IN)	07780–0012200	
Interior cutter, 26 mm (60" EX)	07780–0014500	
Interior cutter, 30 m m (60" IN)	07780–0014000	
Cutter holder, 4.5 mm	07781–0010600	
Cam chain tensioner holder	07ZMG–MCAA400	(U.S.A. only)

TROUBLESHOOTING

- Engine top-end problems usually affect engine performance. These problems can be diagnosed by a compression test or by tracing engine noises to the top-end with a sounding rod or stethoscope.
- If the performance is poor at low speeds, check for white smoke in the crankcase breather hose. If the hose is smoky, check for a seized piston ring (Section 11).

Compression too low, hard starting or poor performance at low speed

- Valves:
  - Incorrect valve adjustment
  - Burned or bent valve
  - Incorrect valve timing
  - Broken valve spring
  - Uneven valve seating
- Cylinder head:
  - Leaking or damaged head gasket
  - Warped or cracked cylinder head
- Worn cylinder, piston or piston rings (section 11)

Compression too high, overheating or knocking

- Excessive carbon build-up on piston crown or on combustion chamber

Excessive smoke

- Cylinder head:
  - Worn valve stem or valve guide
  - Damaged stem seal
- Worn cylinder, piston or piston rings (section 11)

Excessive noise

- Cylinder head:
  - Incorrect valve adjustment
  - Sticking valve or broken valve spring
  - Damaged or worn camshaft
  - Loose or worn cam chain
  - Worn or damaged cam chain
  - Worn or damaged cam chain tensioner
  - Worn cam sprocket teeth
- Worn cylinder, piston or piston rings (section 11)

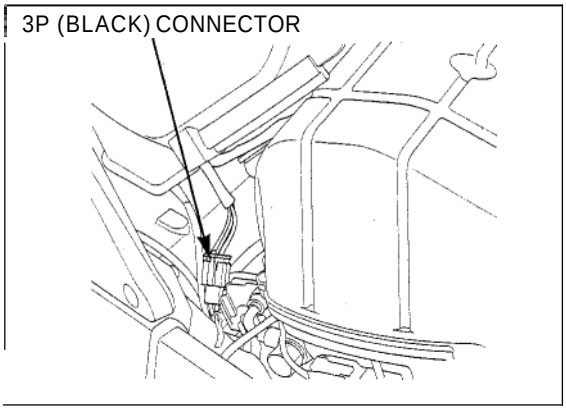
Rough idle

- Low cylinder compression

CYLINDER COMPRESSION TEST

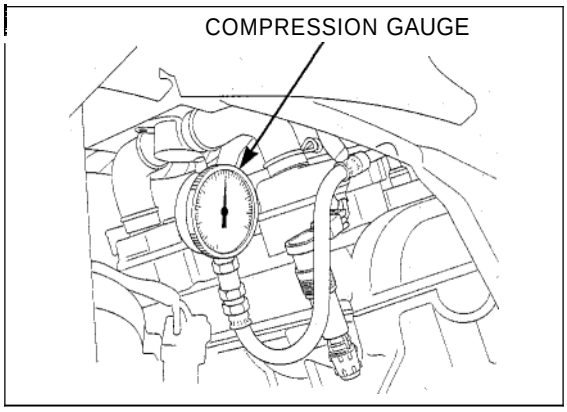
Warm up the engine to normal operating temperature.
Stop the engine and remove all the direct ignition coil/spark plug caps and spark plugs (page 3-6).
Open and support the front end of the fuel tank (page 3-4).

Disconnect the fuel pump/reserve sensor 3P (Black) connector.



Install a compression gauge into the spark plug hole.

TOOL:
Compression gauge attachment
07RMJ–MY50100 (Equivalent commercially available in U.S.A.)



Open the throttle all the way and crank the engine with the starter motor until the gauge reading stops rising.
The maximum reading is usually reached within 4 – 7 seconds.

To avoid discharging the battery, do not operate the starter motor for more than 7 seconds

Compression pressure:
1,196 kPa (12.2 kgf/cm², 174 psi) at 350 rpm

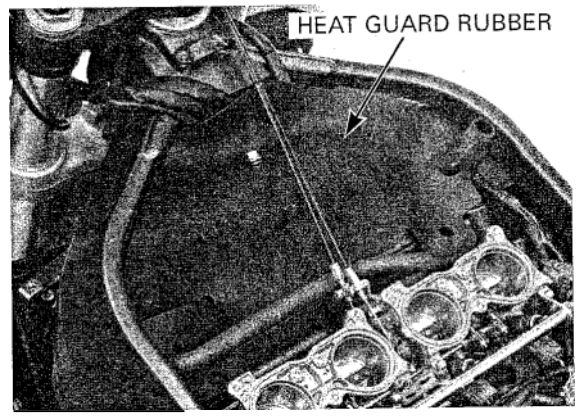
Low compression can be caused by:
- Blown cylinder head gasket
- Improper valve adjustment
- Valve leakage
- Worn piston ring or cylinder

High compression can be caused by:
- Carbon deposits in combustion chamber or on piston head

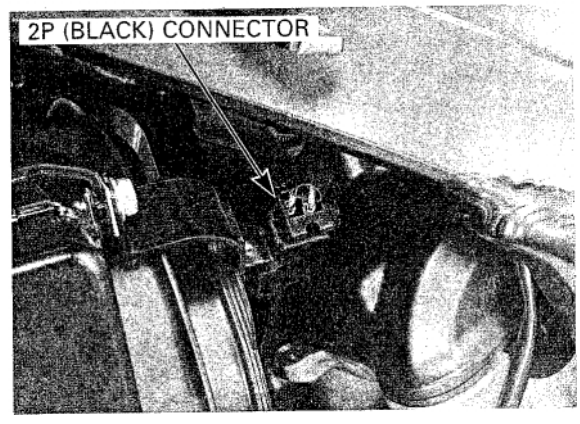
CYLINDER HEAD COVER REMOVAL

Remove the following:
- Lower cowl (page 2-7)
- Air cleaner housing (page 5-64)

Remove the heat guard rubber.

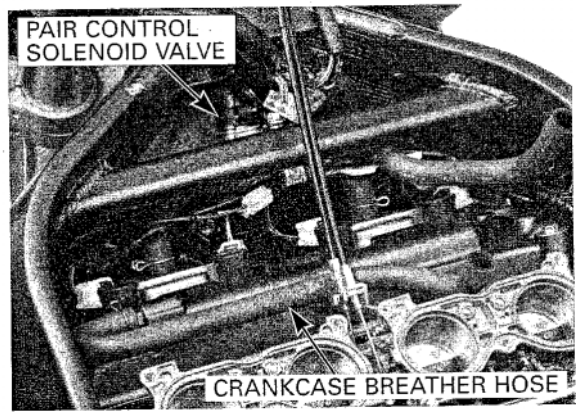


Disconnect the fan motor 2P (Black) connector.



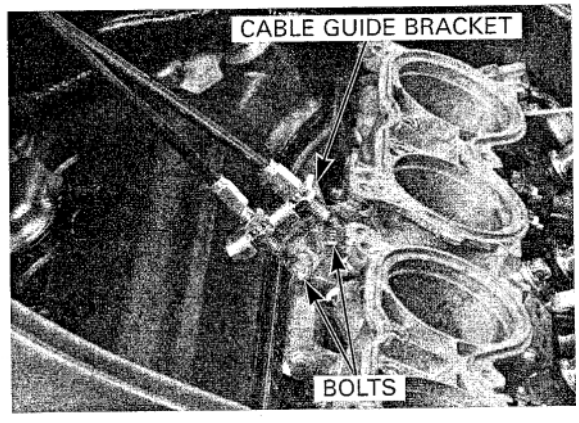
Disconnect the cam pulse generator 2P (natural) connector (page 5-83).
Remove the mounting bolt and PAIR control solenoid valve assembly (page 5-88).
Disconnect the ignition coil sub-harness **4P** (Black) connector and sub-harness (page 17-5).

Disconnect the crankcase breather hose.

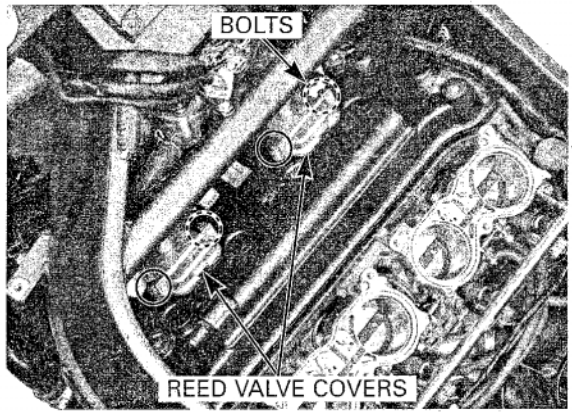


Place a cloth underneath the bolts to avoid dropping them into the engine area

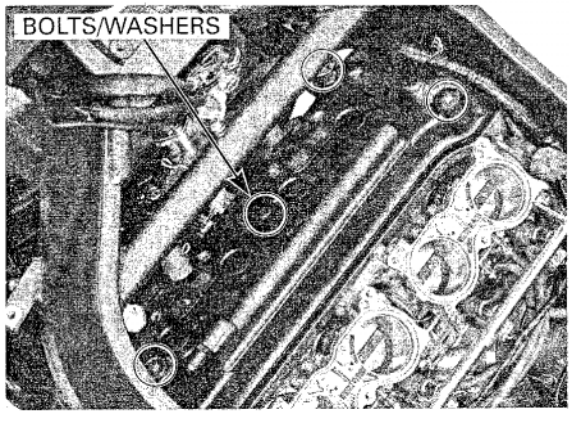
Remove the throttle cable guide bracket mounting bolts.
Disconnect the throttle cable ends from the throttle drum.



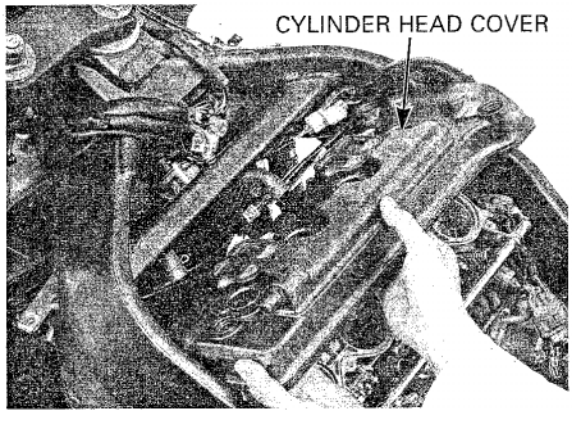
Remove the **SH** bolts and PAIR reed valve covers from the cylinder head.



Remove the cylinder head cover bolts and washers.



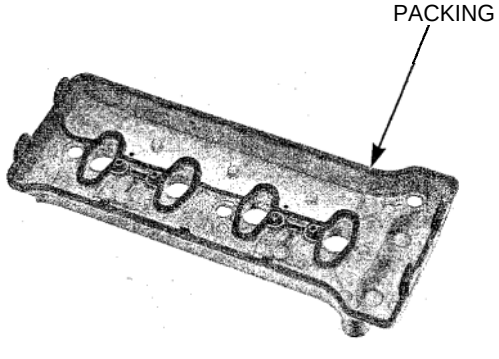
Remove the cylinder head cover rearward.



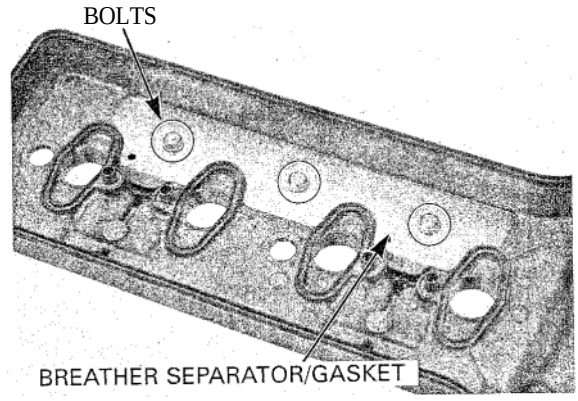
CYLINDER HEAD COVER DISASSEMBLY

Remove the cylinder head cover (page 8-5).

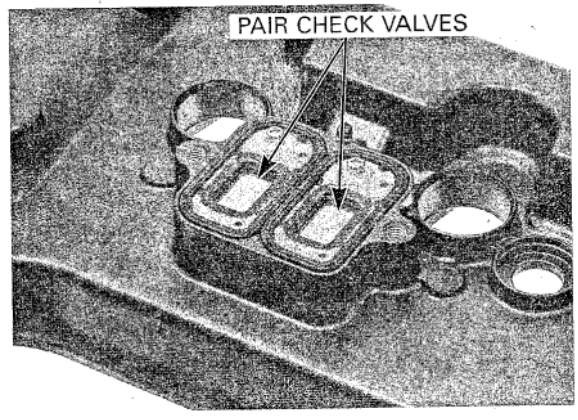
Remove the cylinder head cover packing.



Remove the bolts and breather separator and gasket.



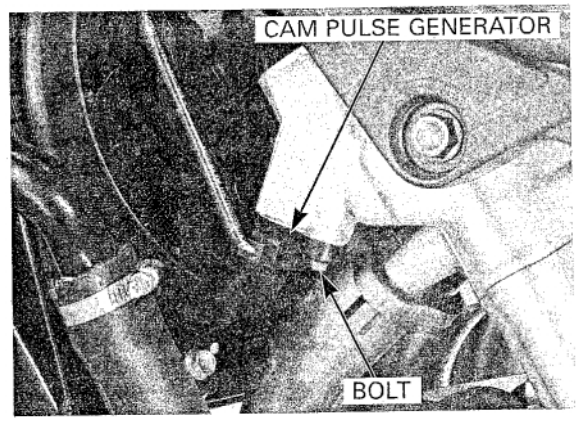
Check the PAIR check valves for wear or damage, replace if necessary.



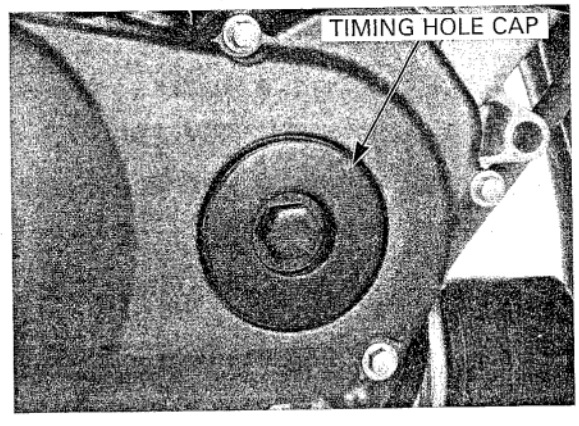
CAMSHAFT REMOVAL

Remove the cylinder head cover (page 8-5).

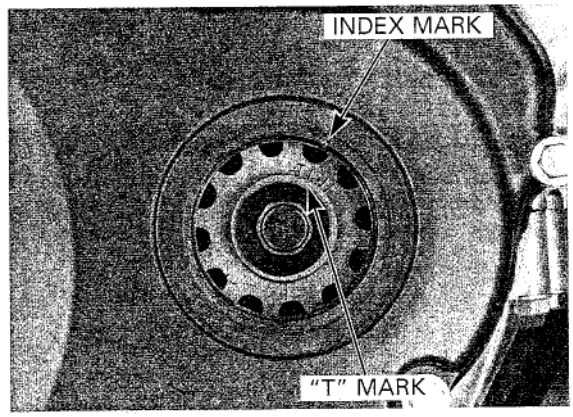
Avoid damaging the cam pulse generator while removing the camshafts, remove the bolt and cam pulse generator from the cylinder head.



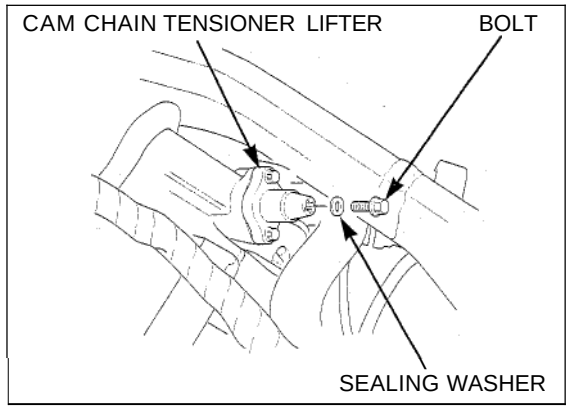
Remove the timing hole cap and O-ring.



Turn the crankshaft clockwise, align the "T" mark on the ignition pulse generator rotor with the index mark on the right crankcase cover.
Make sure the No.1 piston is at TDC (Top Dead Center) on the compression stroke.

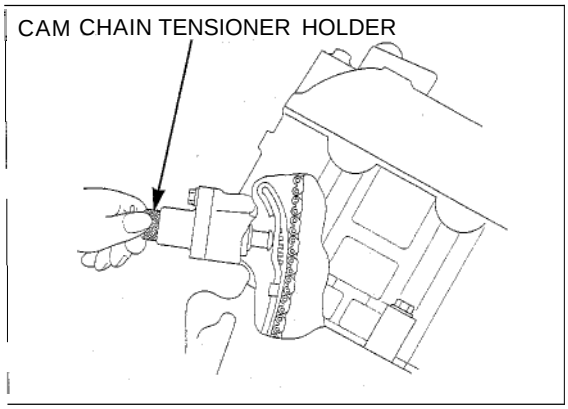


Remove the cam chain tensioner lifter sealing bolt and sealing washer.

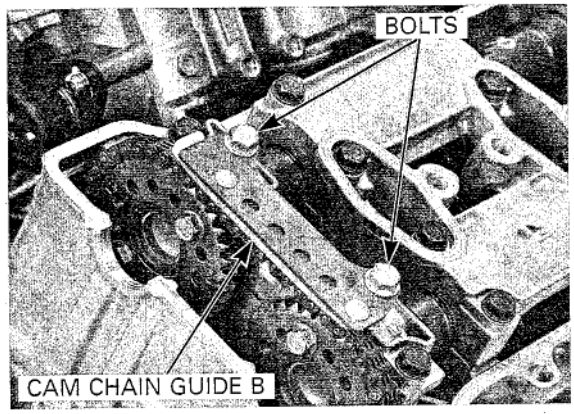


Turn the tensioner lifter shaft fully in (clockwise) and secure it using the cam chain tensioner holder.

TOOL:
Cam chain tensioner holder **07ZMG-MCAA400**
(U.S.A. only)

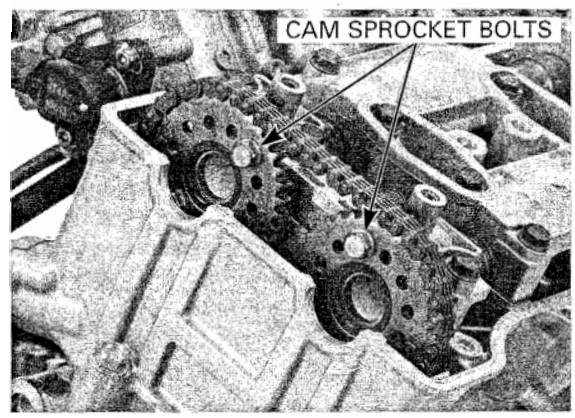


Remove the bolts and cam chain guide B.



It is not necessary to remove the cam sprocket from the camshaft except when replacing the camshaft and/or cam sprocket

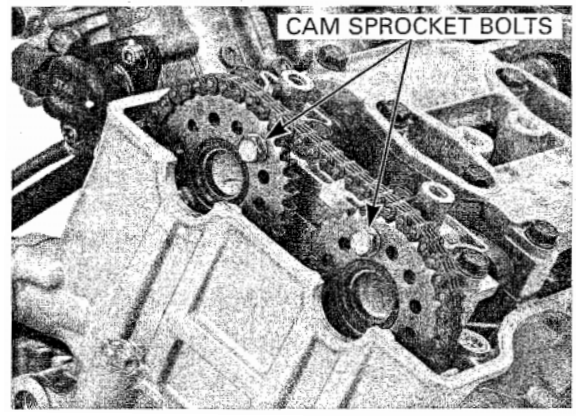
If you plan to replace the camshaft and/or cam sprocket, loosen the cam sprocket bolts as follows:



Be careful not to drop the cam sprocket bolts into the crankcase

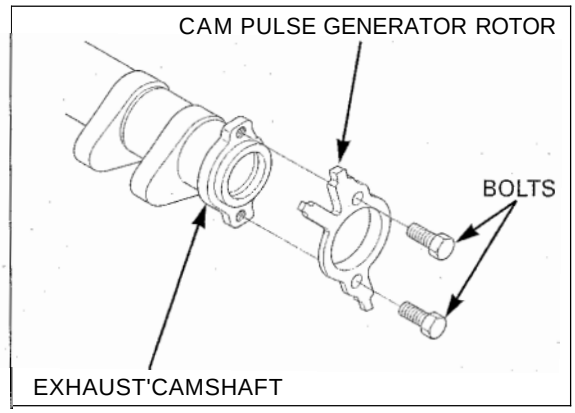
- Remove the cam sprocket bolts from intake and exhaust camshafts.

- Turn the crankshaft one full turn (360°), remove the other cam sprocket bolts from the camshafts.
- Remove the cam sprocket from the camshaft.



Be careful not to drop the rotor or bolts into the crankcase

- Remove the bolts and cam pulse generator rotor from the exhaust camshaft.

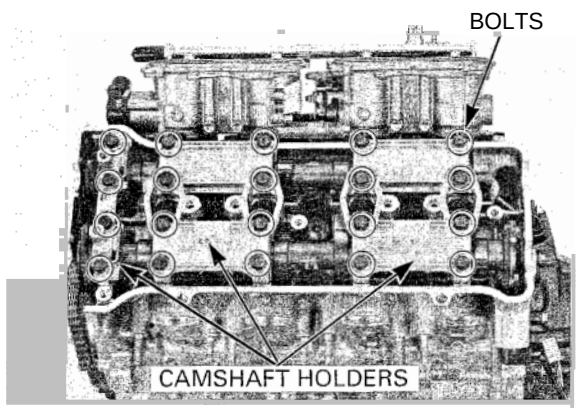


Suspend the cam chain with a piece of wire to prevent the chain from falling into the crankcase.

Loosen and remove the camshaft holder bolts, then remove the camshaft holders and camshafts.

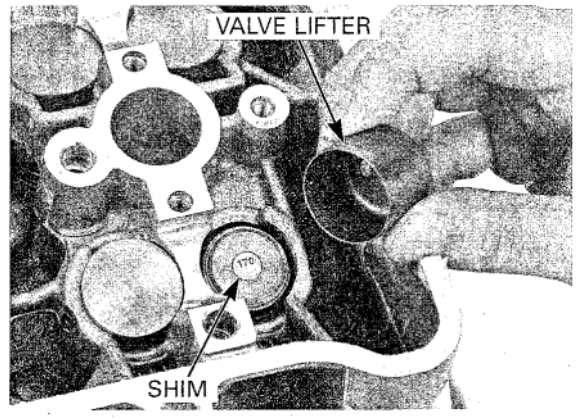
NOTICE

From outside to inside, loosen the bolts in a crisscross pattern in several steps or the camshaft holder might break.



Remove the valve lifters and shims.

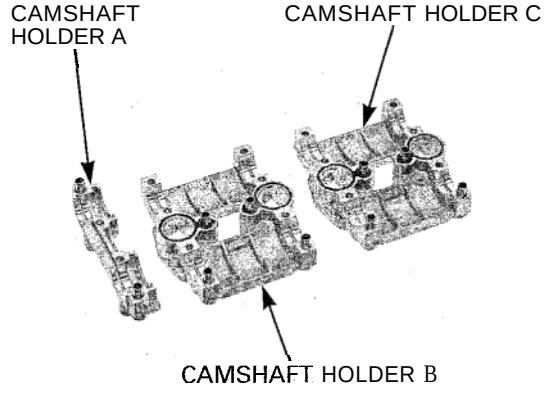
- Be carefui not to damage the valve lifter bore.
- Shims may stick to the inside of the valve lifters. Do not allow the shims to fall into the crankcase.
- Mark all valve lifters and shims to ensure correct reassembly in their original locations.
- The valve lifter can be easily removed with a valve lapping tool or magnet.
- The shims can be easily removed with tweezers or a magnet.



INSPECTION

CAMSHAFT HOLDER

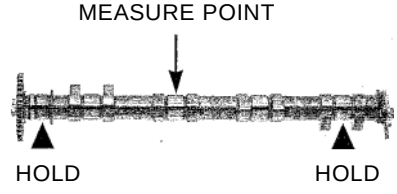
Inspect the bearing surface of each camshaft holder for scoring, scratches, or evidence of insufficient lubrication.



CAMSHAFT RUNOUT

Support both ends of the camshaft with V-blocks and check the camshaft runout with a dial gauge.

SERVICE LIMIT: 0.04 mm (0.002 in)

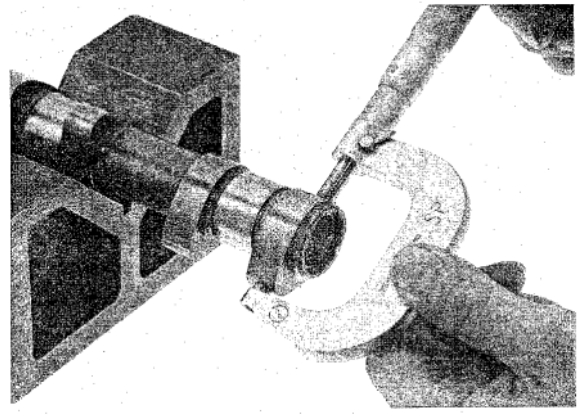


CAM LOBE HEIGHT

Using a micrometer, measure each cam lobe height.

SERVICE LIMITS:

IN: 36.72 mm (1.446 in)
EX: 36.43 mm (1.434 in)

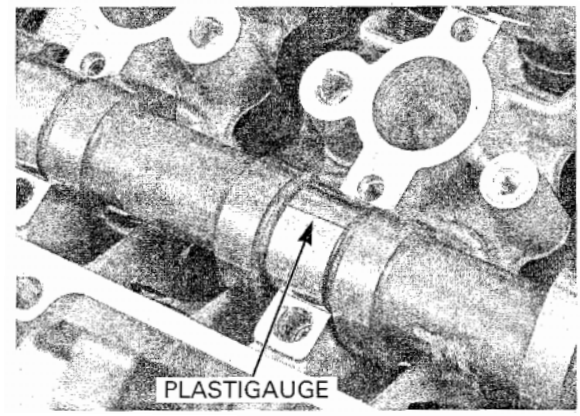


Do not rotate the camshaft during inspection.

CAMSHAFT OIL CLEARANCE

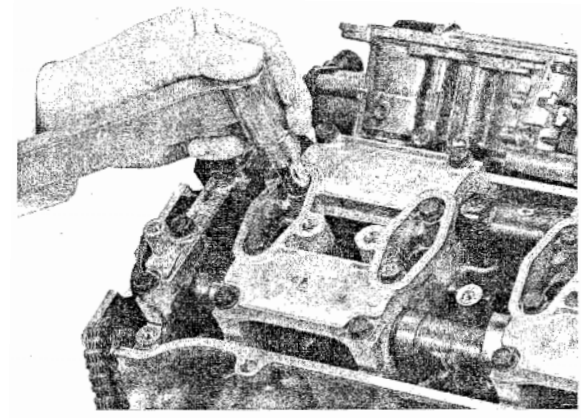
Wipe any oil from the journals of the camshaft, cylinder head and camshaft holders.

Lay a strip of plastigauge lengthwise on top of each camshaft journal.



Install the camshaft holders and tighten the bolts in a crisscross pattern in two to three steps.

TORQUE: 12 N·m (1.2 kgf·m, 9 lbf·ft)



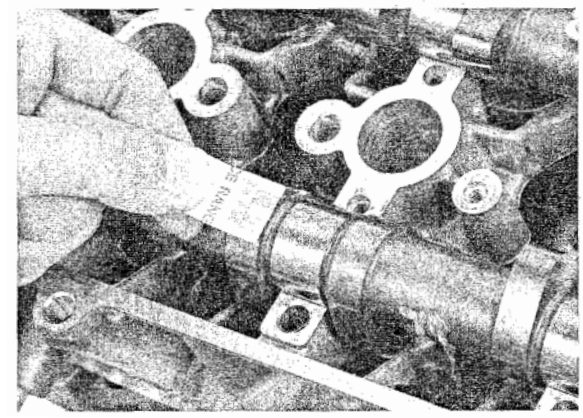
Remove the camshaft holders and measure the width of each plastigauge.

The widest thickness determines the oil clearance.

SERVICE LIMIT: 0.10 mm (0.004 in)

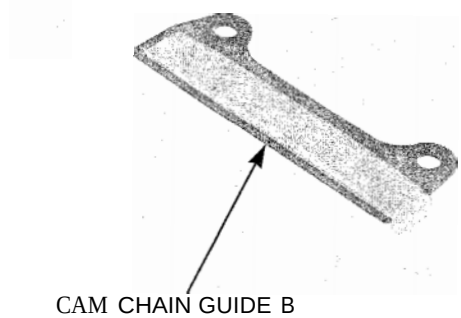
When the service limits are exceeded, replace the camshaft and recheck the oil clearance.

Replace the cylinder head and camshaft holders as a set if the clearance still exceeds the service limit.



CAM CHAIN GUIDE B

Inspect the cam chain slipper surface of the cam chain guide for wear or damage.

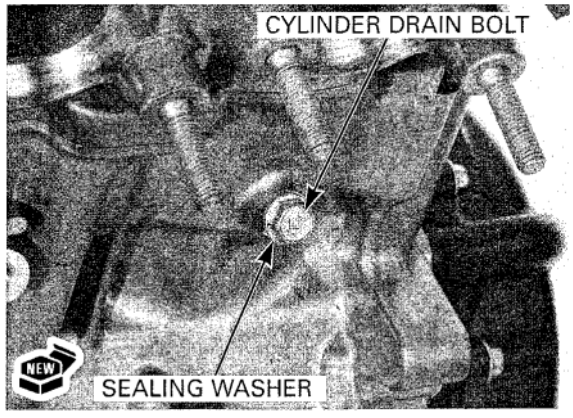


CYLINDER HEAD REMOVAL

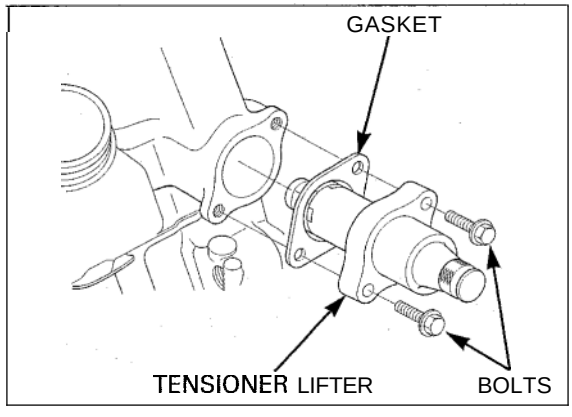
Remove the engine from the frame (page 7-3).
Remove the camshaft (page 8-7).

Remove the cylinder drain bolt and sealing washer.
Drain coolant from cylinder head and cylinder block.

Reinstall a new sealing washer and drain bolt.



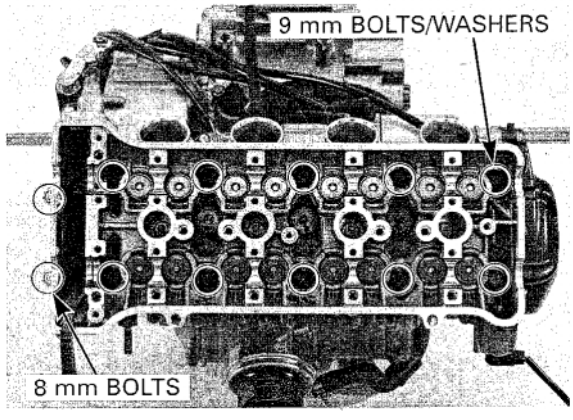
Remove the bolts and cam chain tensioner lifter and gasket.



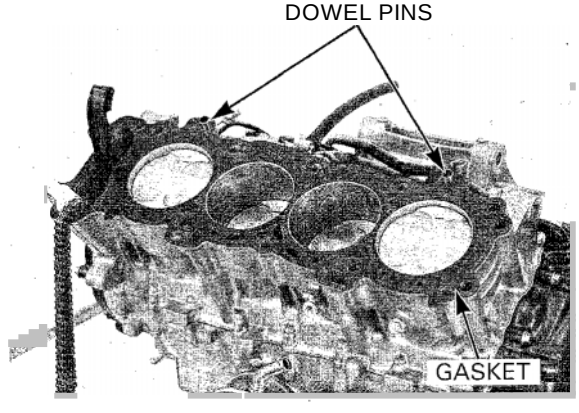
Loosen the 9 mm bolts in a criss-cross pattern in two or three steps.

Remove the two 8 mm flange bolts.
Remove the ten 9 mm bolts/washers.

Remove the cylinder head.

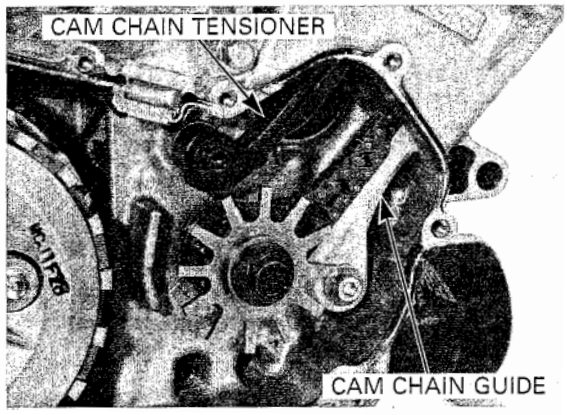


Remove the dowel pins and cylinder head gasket.

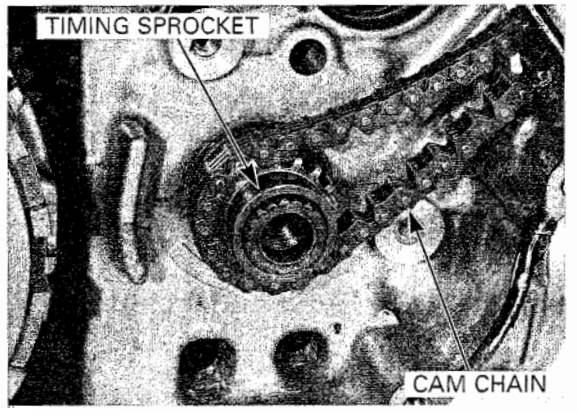


Remove the right crankcase cover and ignition pulse generator rotor (page 17-6).

Remove the socket bolt, washer, cam chain guide and collar.
Remove the socket bolt, cam chain tensioner and washer.



Remove the cam chain and timing sprocket from the crankshaft.



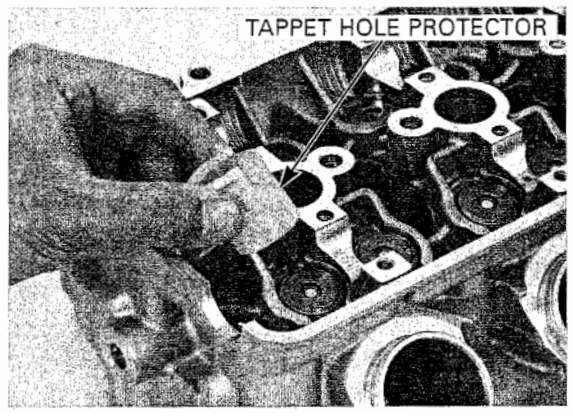
CYLINDER HEAD DISASSEMBLY

Remove the cylinder head (page 8-12).

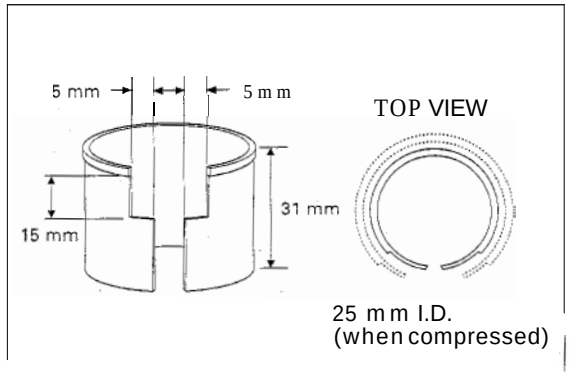
Remove the spark plugs from the cylinder head.

Install the tappet hole protector into the valve lifter bore.

TOOL:
Tappet hole protector **07HMG–MR70002**
(Not available in U.S.A.)

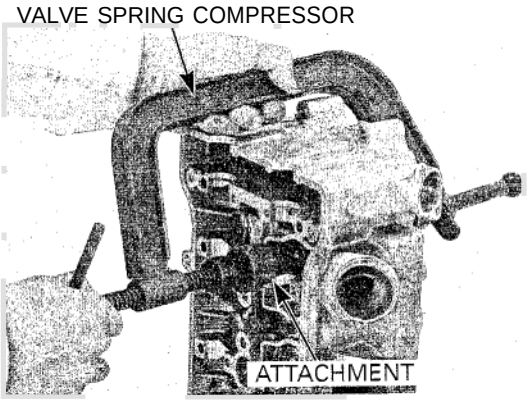


An equivalent tool can easily be made from a plastic 35 mm film container as shown.



Remove the valve spring cotters using the special tools as shown.

TOOLS:
Valve spring compressor 07757-0010000
Valve spring compressor attachment 07959–KM30101

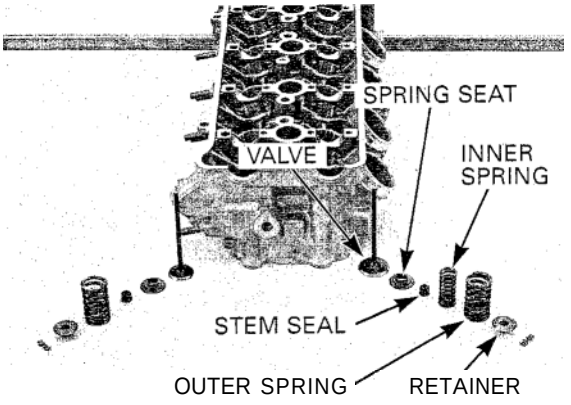


NOTICE

To prevent loss of tension, do not compress the valve springs more than necessary to remove the cotters.

Mark all parts during disassembly so they can be placed back in their original locations

Remove the following:
- Spring retainer
- Intake valve springs (Orange painted)
- Exhaust valve spring (Pink painted)
- Valve
- Stem seal
- Valve spring seat

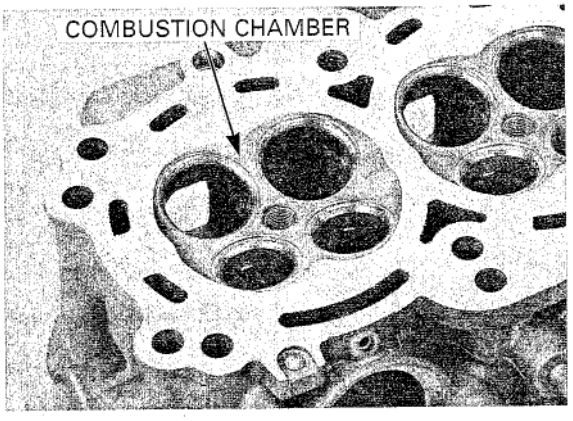


CYLINDER HEAD INSPECTION

CYLINDER HEAD

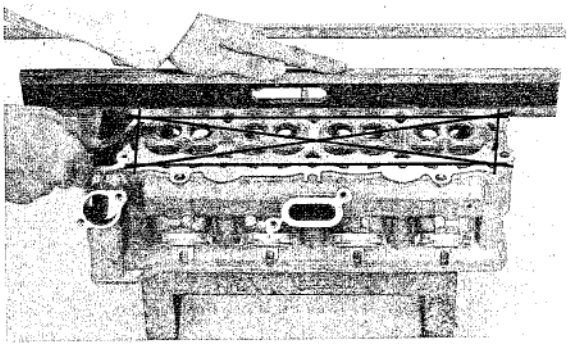
Avoid damaging the gasket surface.

Remove carbon deposits from the combustion chambers.
Check the spark plug hole and valve areas for cracks.



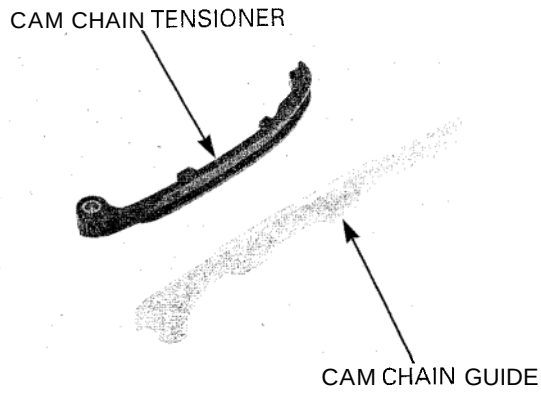
Check the cylinder head for warpage with a straight edge and feeler gauge.

SERVICE LIMIT: 0.10 mm (0.004 in)



CAM CHAIN TENSIONER/CAM CHAIN GUIDE

Inspect the cam chain tensioner and cam chain guide for excessive wear or damage, replace if necessary.

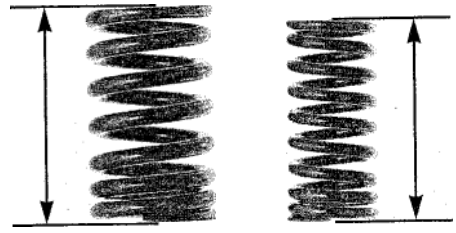


VALVE SPRING

Measure the free length of the inner and outer valve springs.

SERVICE LIMITS:
Intake: Inner: 33.1 mm (1.30 in)
Outer: 36.1 mm (1.42 in)
Exhaust: 37.6 mm (1.48 in)

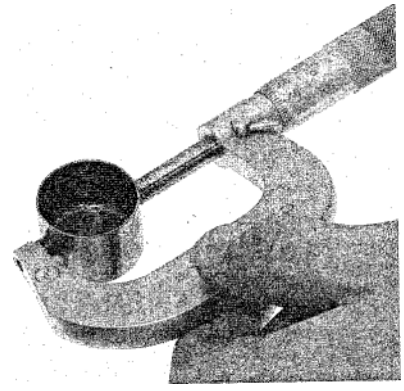
Replace the springs if they are shorter than the service limits.



VALVE LIFTER

Inspect each valve lifter for scratches or abnormal wear.
Measure the each valve lifter O.D.

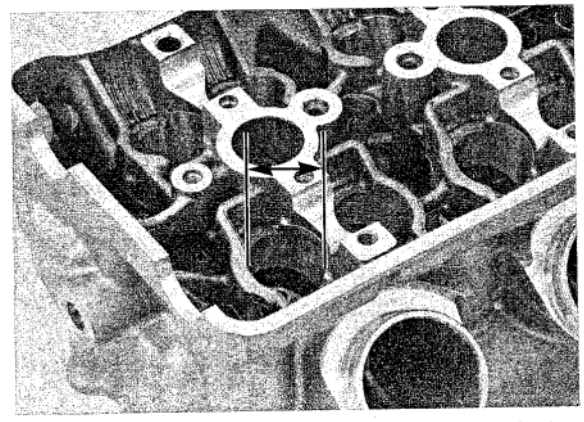
SERVICE LIMIT: 25.97 mm (1.022 in)



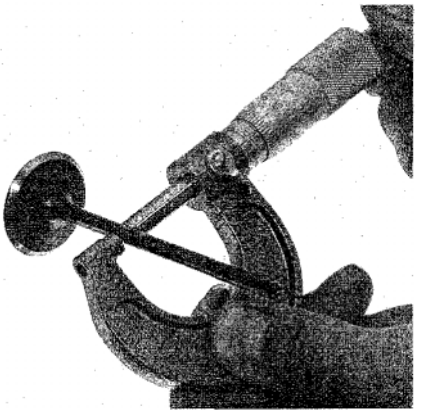
VALVE LIFTER BORE

Inspect each valve lifter bore for scratches or abnormal wear.
Measure the each valve lifter bore I.D.

SERVICE LIMIT: 26.04 mm (1.025 in)

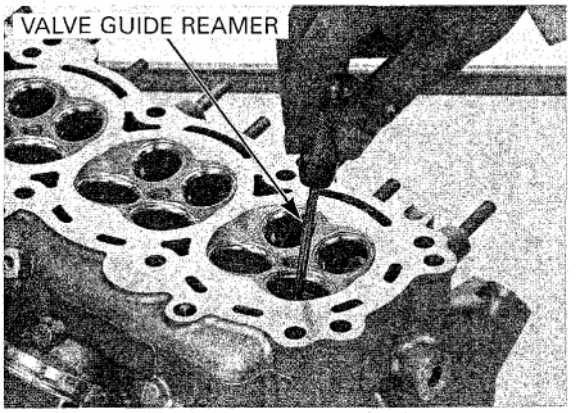


VALVE/VALVE GUIDE



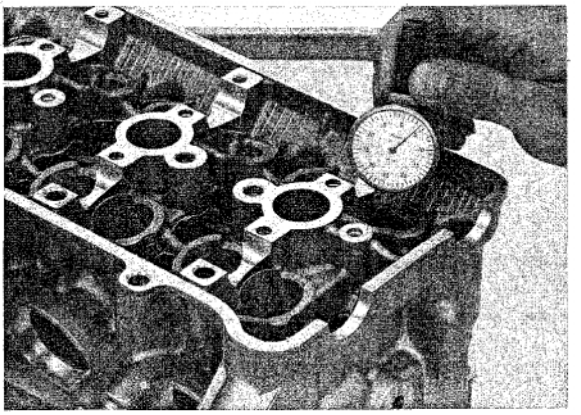
Inspect each valve for bends, burns or abnormal stem wear.
Check valve movement in the guide, measure and record each valve stem O.D.

SERVICE LIMITS:
IN: 4.465 mm (0.1758 in)
EX: 4.455 mm (0.1754 in)



Ream the guides to remove any carbon deposits before checking clearances.
Insert the reamer from the combustion chamber side of the head and always rotate the reamer clockwise.

TOOL:
Valve guide reamer, 4.5 mm **07HMH-ML00101 or 07HMH-MLOO10A (U.S.A. only)**



Measure and record each valve guide I.D.

SERVICE LIMIT: IN/EX: 4.540 mm (0.1787 in)

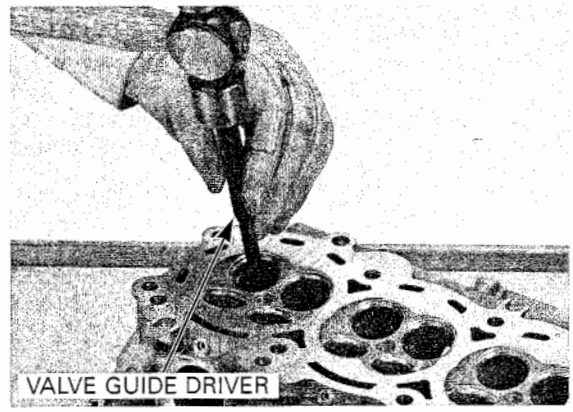
Subtract each valve stem O.D. from the corresponding guide I.D. to obtain the stem-to-guide clearance.

STANDARDS:
IN: 0.010 – 0.037 mm (0.0004 – 0.0015 in)
EX: 0.020 – 0.047 mm (0.0008 – 0.0019 in)

Reface the valve seats whenever the valve guides are replaced (page 8-18).

If the stem-to-guide clearance is out of standard, determine if a new guide with standard dimensions would bring the clearance within tolerance. If so, replace any guides as necessary and ream to fit.
If the stem-to-guide clearance is out of standard with the new guides, replace the valves and guides.

VALVE GUIDE REPLACEMENT



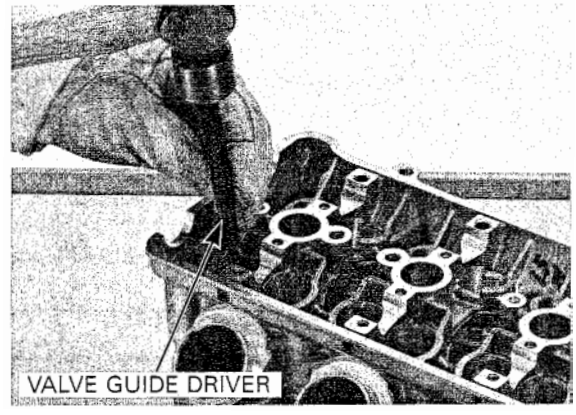
Chill the replacement valve guides in a freezer for about 1 hour.
Heat the cylinder head to 100 – 150°C (212 – 300°F) with a hot plate or oven.
To avoid burns, wear heavy gloves when handling the heated cylinder head.

NOTICE

Do not use a torch to heat the cylinder head; it may cause warpage.

Support the cylinder head and drive out the valve guides from combustion chamber side of the cylinder head.

TOOL:
Valve guide driver, 4.5 mm 07HMD-ML00101

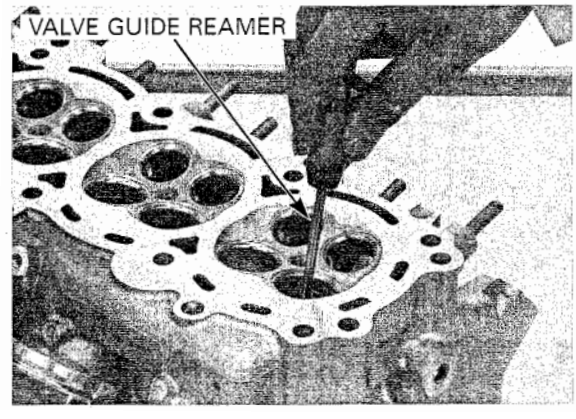


Drive in the guide to the specified depth from the top of the cylinder head.

SPECIFIED DEPTH:
IN: 14.3 – 14.6 mm (0.56 – 0.57 in)
EX: 12.4 – 12.7 mm (0.49 – 0.50 in)

TOOL:
Valve guide driver, 4.5 mm 07HMD-ML00101

Let the cylinder head cool to room temperature.



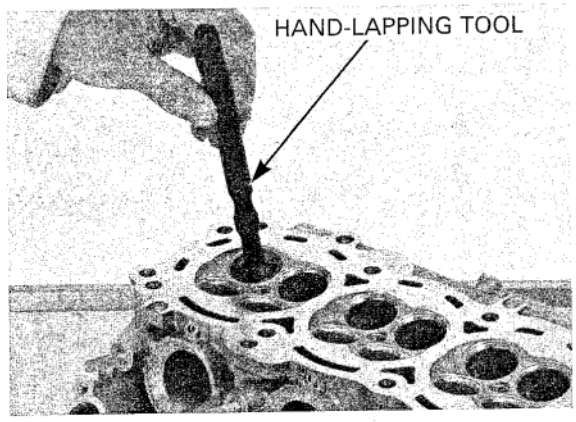
Use cutting oil on the reamer during this operation.

Ream the new valve guide after installation.
Insert the reamer from the combustion chamber side of the head and also always rotate the reamer clockwise.

TOOL:
Valve guide reamer, 4.5 mm 07HMH-ML00101 or 07HMH-ML001OA **(U.S.A. only)**

Clean the cylinder head thoroughly to remove any metal particles.
Reface the valve seat (page 8-18).

VALVE SEAT INSPECTION/REFACING

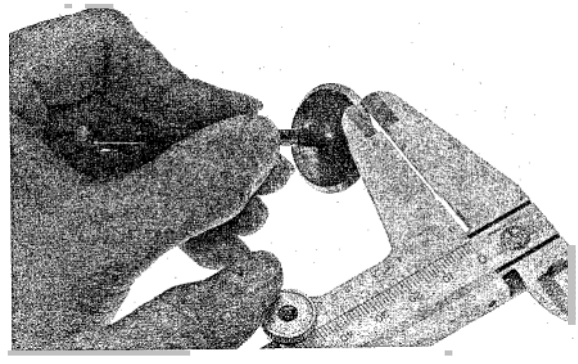


Clean the intake and exhaust valves thoroughly to remove carbon deposits.
Apply a light coating of Prussian Blue to the valve seats.
Lap the valves and seats using a rubber hose or other hand-lapping tool.
Remove and inspect the valves.

The valves cannot be ground If a valve face is burned or badly worn or if it contacts the seat unevenly, replace the valve.

Inspect the width of each valve seat.

STANDARD: 0.90 – 1.10 mm (0.035 – 0.043 in)
SERVICE LIMIT: 1.5 mm (0.06 in)

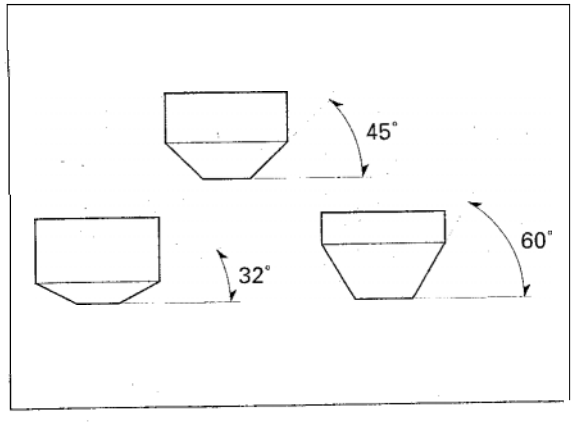


If the seat is too wide, too narrow or has low spots, the seat must be ground.

VALVE SEAT REFACING

Follow the valve refacing equipment manufacturer's operating instructions.

Valve seat cutters/grinders or equivalent valve seat refacing equipment are recommended to correct worn valve seats.



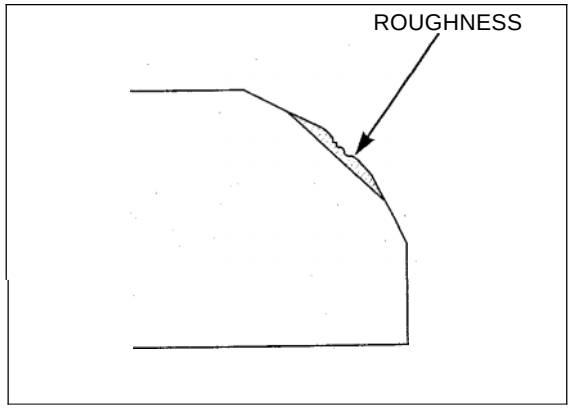
Reface the seat with a 45-degree cutter whenever a valve guide is replaced

Use a 45-degree cutter to remove any roughness or irregularities from the seat.

TOOLS:

Seat cutter, 29 mm (45° IN)	**07780–0010300**
Seat cutter, 24.5 mm (45° EX)	**07780–0010100**
Cutter holder, 4.5 mm	**07781–0010600**

or equivalent commercially available in U.S.A.

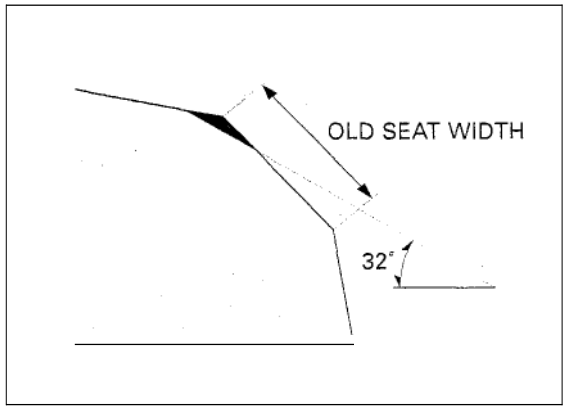


Use a 32-degree cutter to remove the top 1/4 of the existing valve seat material.

TOOLS:

Flat cutter, 30 mm (32° IN)	**07780–0012200**
Flat cutter, 28 mm (32° EX)	**07780–0012100**
Cutter holder, 4.5 mm	**07781–0010600**

or equivalent commercially available in U.S.A.

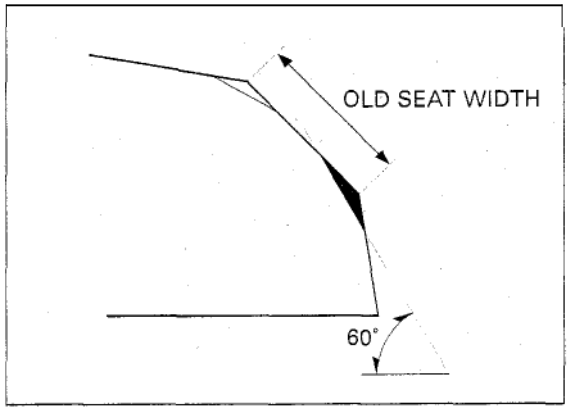


Use a 60-degree cutter to remove the bottom 1/4 of the old seat.
Remove the cutter and inspect the area you have refaced.

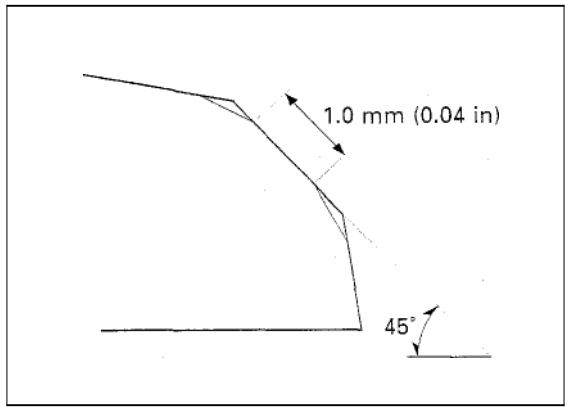
TOOLS:

Interior cutter, 30 mm (60° IN)	**07780–0014000**
Interior cutter, 26 mm (60° EX)	**07780–0014500**
Cutter holder, 4.5 mm	**07781–0010600**

or equivalent commercially available in U.S.A.



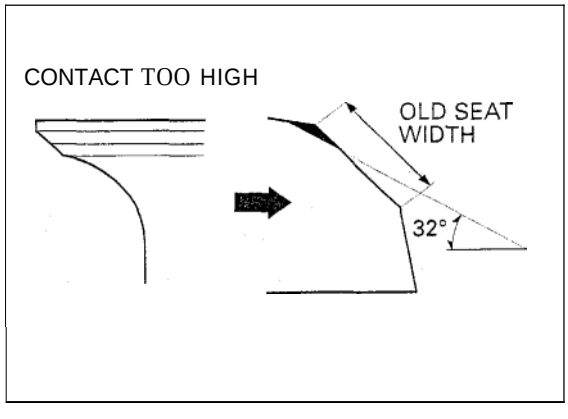
Install a 45-degree finish cutter and cut the seat to the proper width.
Make sure all pitting and irregularities are removed.
Refinish if necessary.



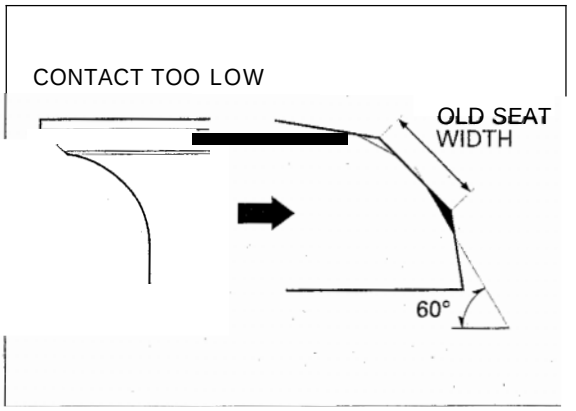
The location of the valve seat in relation to the valve face is very important for good sealing

Apply a thin coating o Prussian Blue to the valve seat. Press the valve through the valve guide and onto the seat to make a clear pattern.

If the contact area is too high on the valve, the seat must be lowered using a 32 degrees flat cutter.



If the contact area *is* too low on the valve, the seat must be raised using a 60-degree inner cutter.

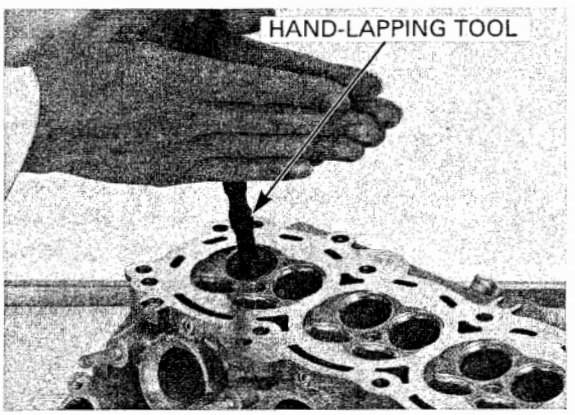


Refinish the seat to specifications, using a 45-degree finish cutter.

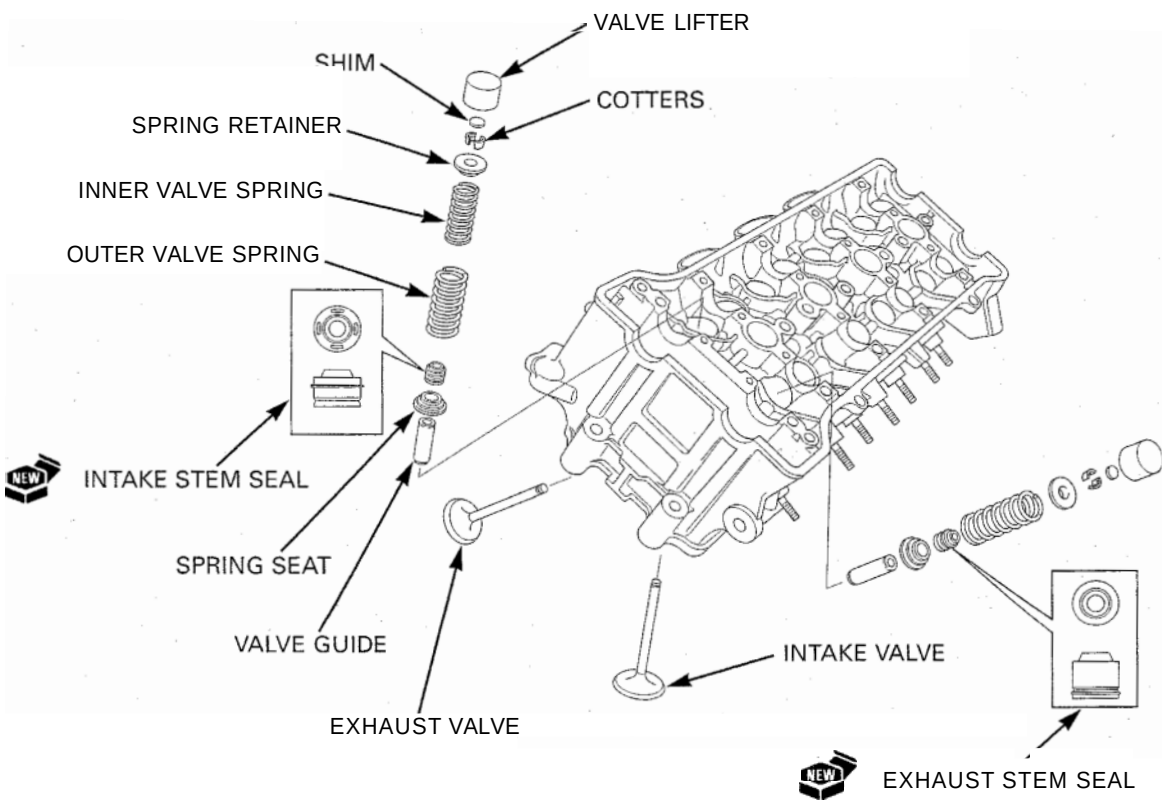
After cutting the seat, apply lapping compound to the valve face, and lap the valve using light pressure.

Do not allow lapping compound to enter the guides.

After lapping, wash all residual compound off the cylinder head and valve.



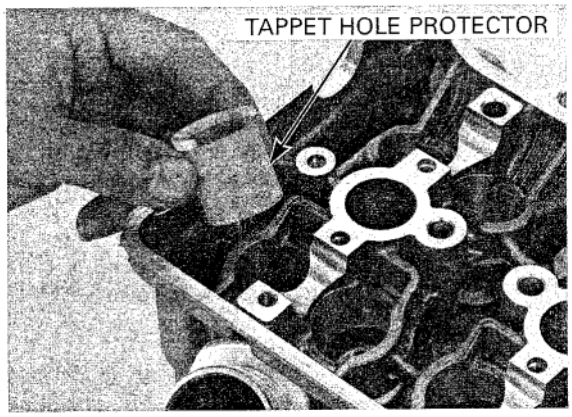
CYLINDER HEAD ASSEMBLY



Clean the cylinder head assembly with solvent and blow out all oil passages with compressed air.

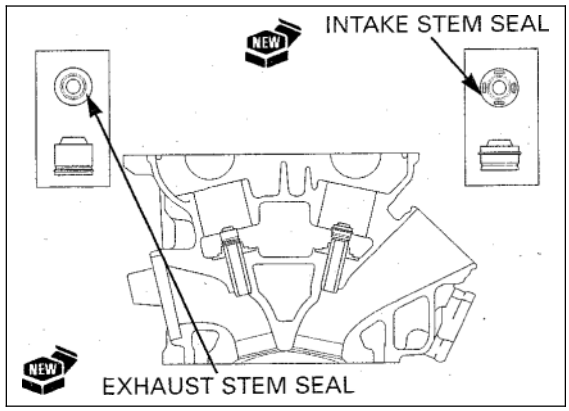
Install the tappet hole protector into the valve lifter bore.

TOOL:
Tappet hole protector **07HMG–MR70002 (Not available in U.S.A.) or refer to page 8-13 for alternative tool**



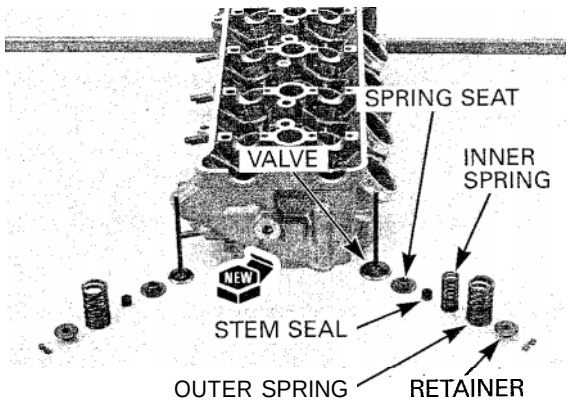
Do not interchange the inlet and exhaust valve stem seal.

Install the valve spring seats.
Install the new stem seals.



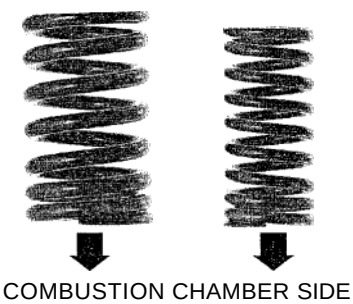
Lubricate the valve stems with molybdenum disulfide oil and insert the valve into the valve guide.

To avoid damage to the stem seal, turn the valve slowly when inserting.

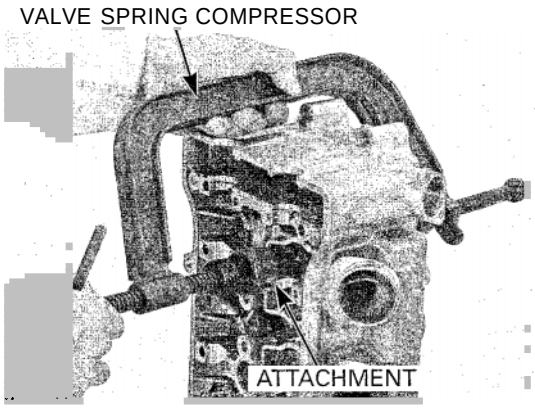


The exhaust valve spring has a pink paint mark and the intake valve springs have orange paint marks

Install the valve springs with the tightly wound coils facing the combustion chamber.
Install the valve spring retainer.



Install the valve cotters using the special tool as shown.



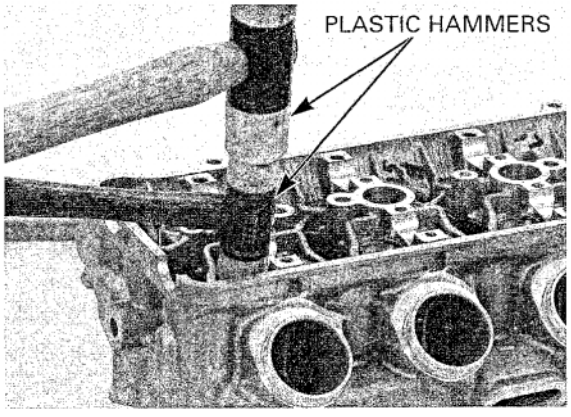
NOTICE

To prevent loss of tension, do not compress the valve spring more than necessary.

TOOLS:
Valve spring compressor 07757-0010000
Valve spring compressor attachment 07959-KM30101

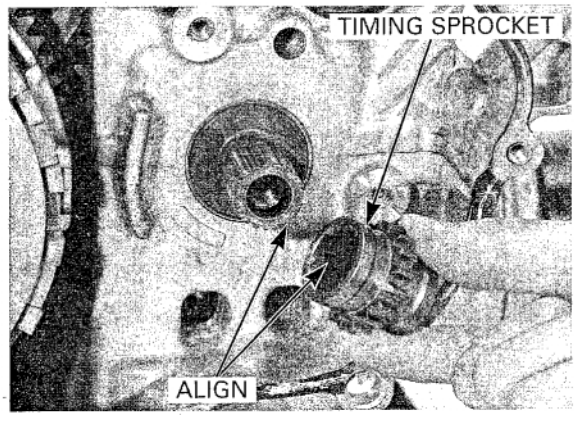
Support the cylinder head above the work bench surface to prevent possible valve damage

Tap the valve stems gently with two plastic hammers as shown to seat the cotters firmly.

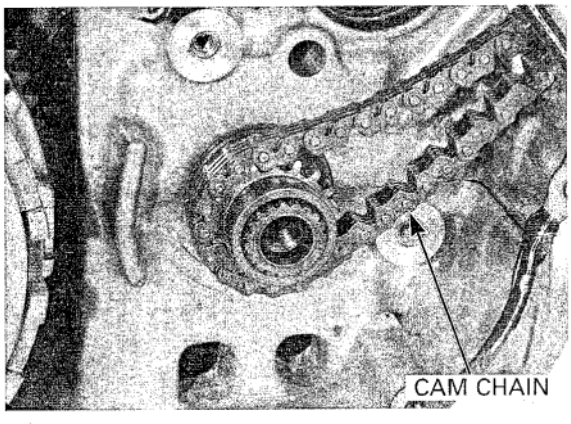


CYLINDER HEAD INSTALLATION

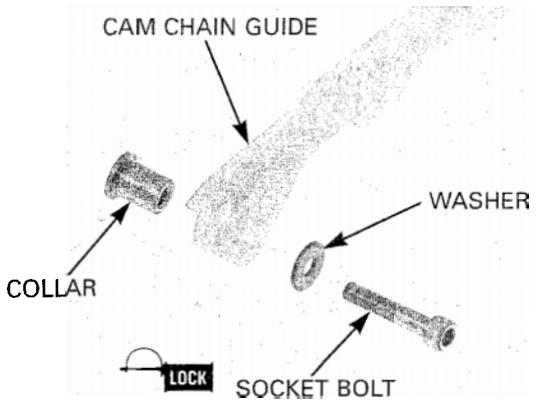
Install the timing sprocket by aligning the wide teeth between the crankshaft and sprocket.



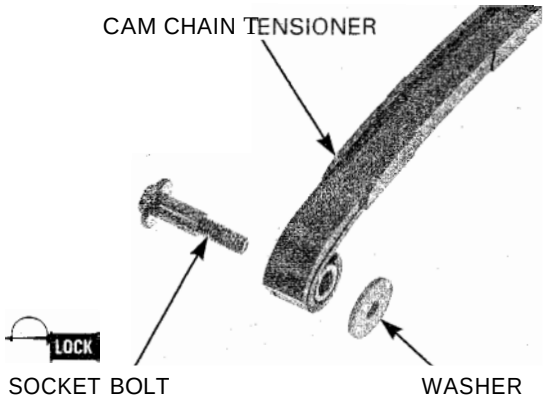
Install the cam chain.



Apply a locking agent to the cam chain guide socket bolt threads.
Install the collar, cam chain guide, washer and socket bolt.



Apply a locking agent to the cam chain tensioner socket bolt threads.
Install the washer, cam chain tensioner and socket bolt.

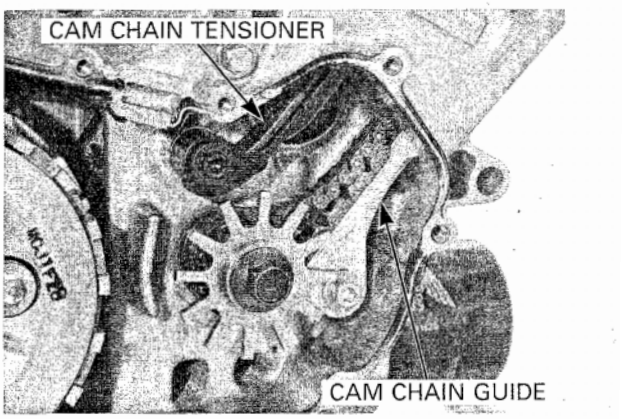


Tighten the cam chain guide and cam chain tensioner socket bolts to the specified torque.

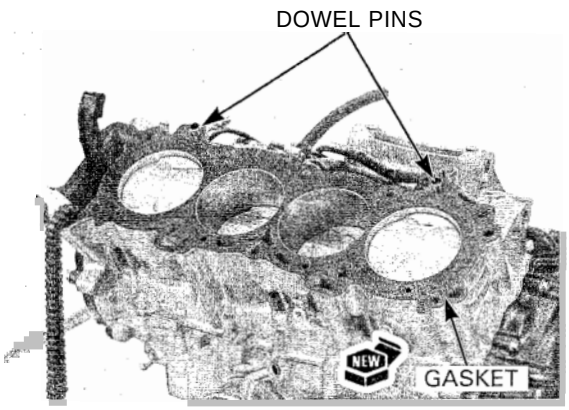
TORQUE:

Cam chain tensioner pivot socket bolt:
10 N·m (1.0 kgf·m, 7 lbf·ft)
Cam chain guide mounting socket bolt:
12 N·m (1.2 kgf·m, 9 lbf·ft)

Install the ignition pulse generator rotor and right crankcase cover (page 17-7).



Install the dowel pins and a new cylinder head gasket as shown.



Install the cylinder head.

If using a new bolt, remove the anti-rust additive from it.
Apply molybdenum disulfide oil to the threads and seating surface of the 9 mm bolts/washers and install them.

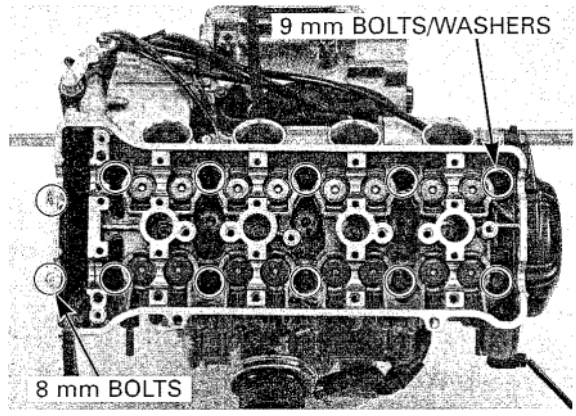
Apply oil to the 8 mm bolt threads and seating surface.
Install the two 8 mm flange bolts.

Tighten the 9 mm bolts in a crisscross pattern in *2* – 3 steps to the specified torque.

TORQUE: 51 N·m *(5.2* kgf·m, 38 lbf·ft)

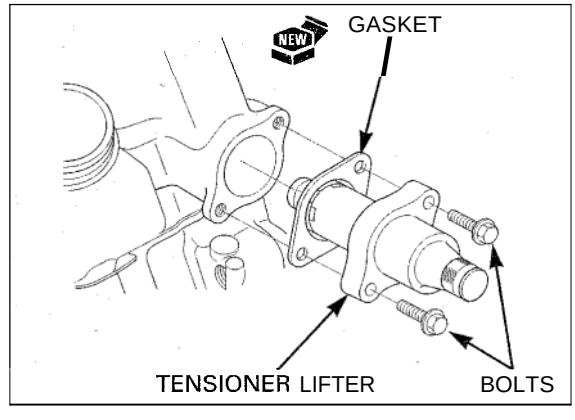
Tighten the 8 mm flange bolts to the specified torque.

TORQUE: 24 N·m (2.4 kgf·m, 17 lbf·ft)



Install the cam chain tensioner lifter onto the cylinder head with new gasket.
Install and tighten the mounting bolts.

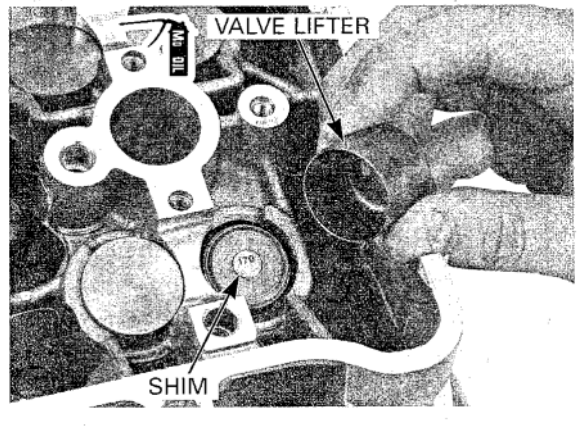
Install the engine into the frame (page 7-7).



CAMSHAFT INSTALLATION

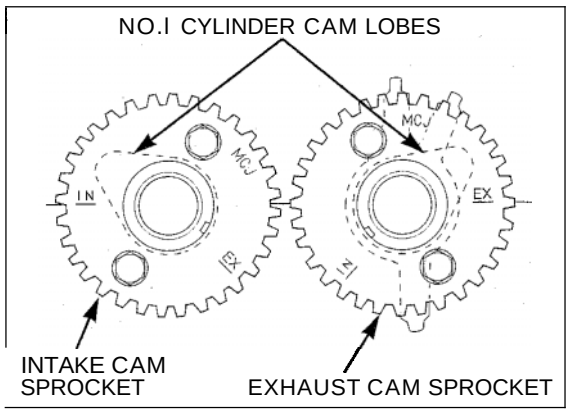
Apply molybdenum disulfide oil to the outer surface of the each valve lifter.

Install the shims and valve lifters into the valve lifter bores.

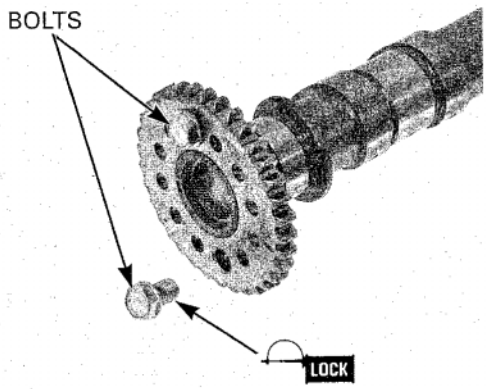


If the cam sprockets are removed, install the cam sprockets onto the camshafts.

- Install the intake cam sprocket with the timing mark (IN) facing outward and the No.1 cam lobes facing up and out as shown.
- Install the exhaust cam sprocket with the timing mark (EX) facing outward and the No.1 cam lobes facing up and out as shown.



Clean and apply a locking agent to the cam sprocket bolt threads.
Install the cam sprocket bolts.

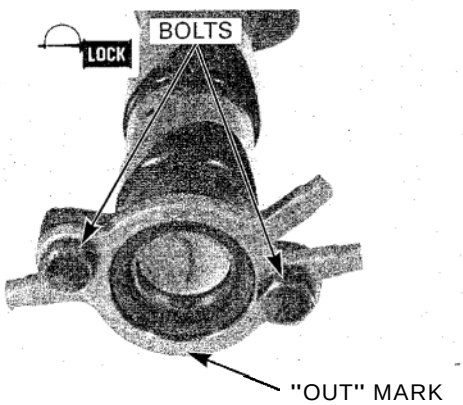


Exhaust camshaft only:

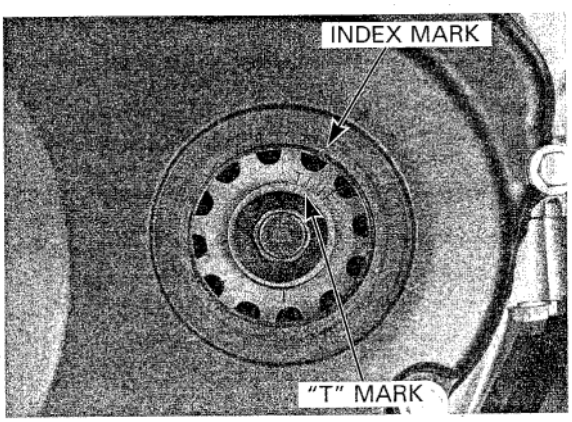
Clean and apply a locking agent to the cam cam pulse generator rotor threads.

Install the cam pulse generator rotor with the No I camshaft iobes facing up and rotor "OUT" mark facing down as shown.

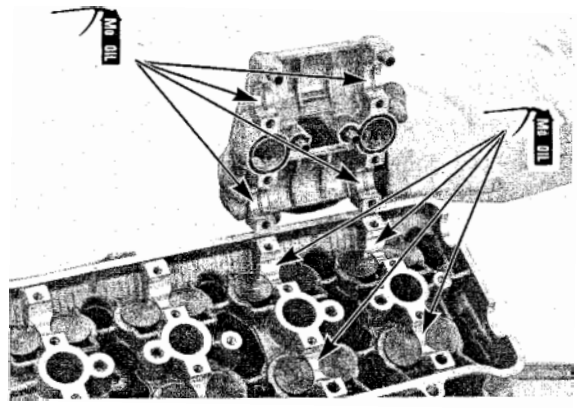
Install the cam pulse generator rotor and mounting bolts.



Turn the crankshaft clockwise and align the "T" mark on the ignition pulse generator rotor with the index mark on the right crankcase cover.

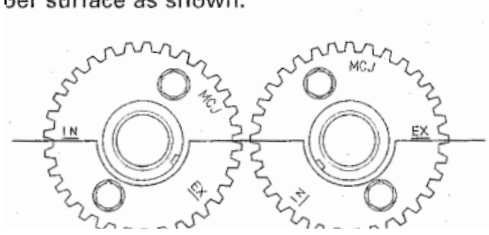


Apply molybdenum disulfide oil to the camshaft journals of the cylinder head and camshaft holder.

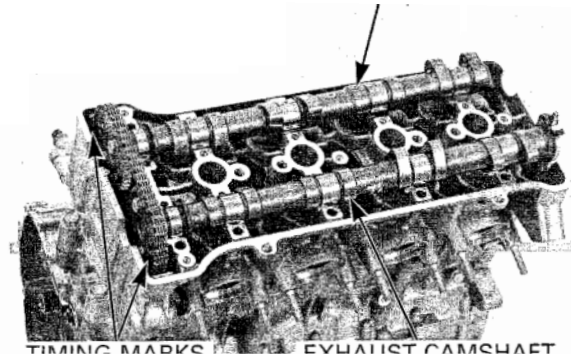


Install the cam chain over the cam sprockets and then install the intake and exhaust camshafts.

- Install each camshaft to the correct location with the identification marks.
  "IN": Intake camshaft
  "EX": Exhaust camshaft
- Make sure the timing marks on the cam sprockets are facing outward and flush with the cylinder head upper surface as shown.

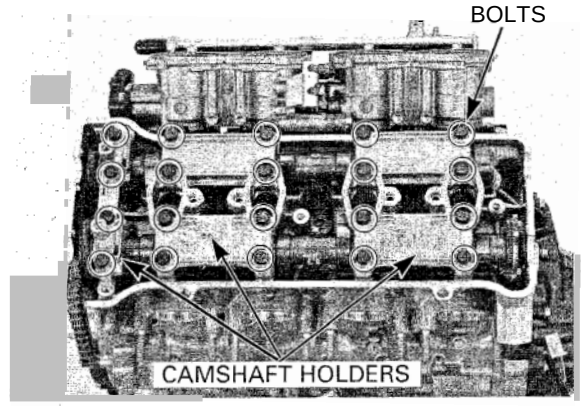


INTAKE CAMSHAFT



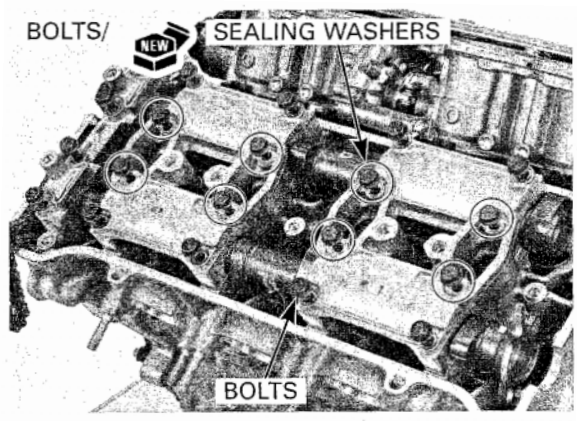
Install the each camshaft holder onto the camshafts.

Install the each camshaft holder to the correct locations with the identification marks.
"A": Right camshaft holder
"B": Center camshaft holder
"C": Left camshaft holder

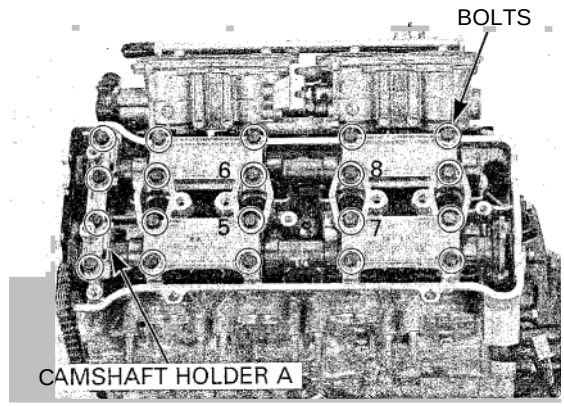


Install the sealing washers onto camshaft holder 5 and C's center four bolts as shown

Apply engine oil to the threads and seating surfaces of the camshaft holder bolts.
Install the 20 holder bolts with eight new washers as shown.
Finger tighten the bolts.



First gradually tighten the four bolts (No.5 – No.6 – No.7 – No.8) in the numerical order casted on the camshaft holders.
Gradually tighten the other camshaft holder bolts until the camshaft holders lightly contact the cylinder head surface.



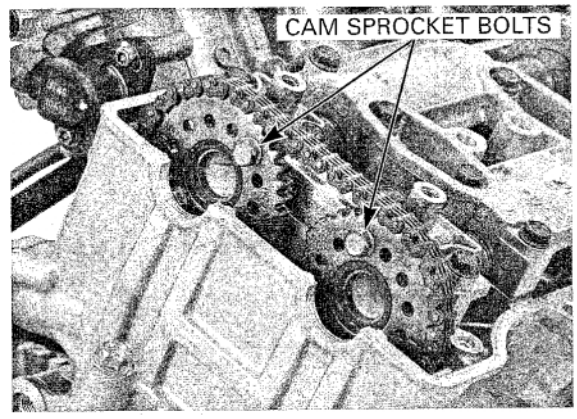
NOTICE

Tightening the camshaft holder bolts on only one-side might cause a camshaft holder to break.

Tighten all camshaft holder bolts in the numerical order casted on the camshaft holders.

TORQUE: 12 N·m (1.2 kgf·m, 9 lbf·ft)

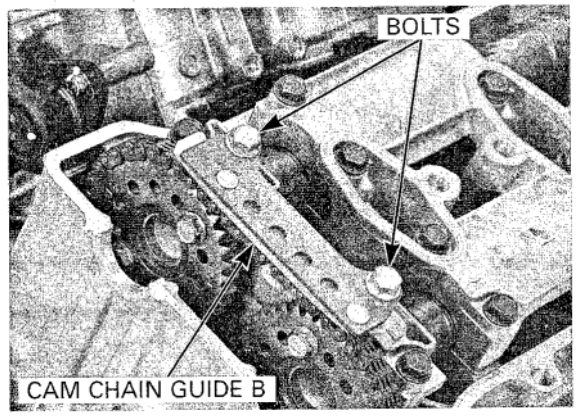
In case the cam sprockets were removed, tighten the cam sprocket bolts to the specified torque.



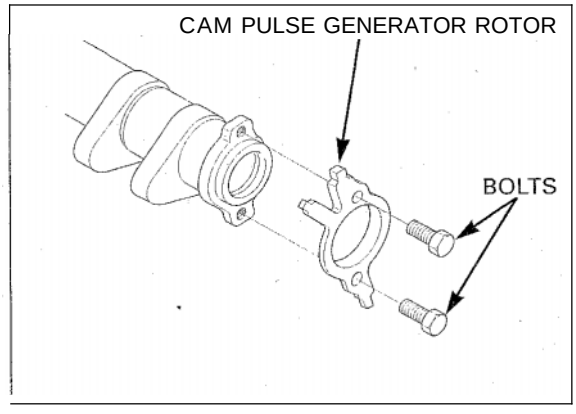
TORQUE: 20 N·m (2.0 kgf·m, 14 lbf·ft)

Turn the crankshaft clockwise one full turn (360°) and tighten the other cam sprocket bolts.

Install cam chain guide B, and tighten the bolts.

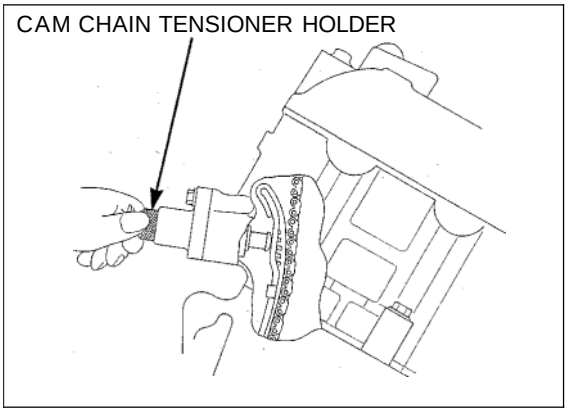


In case the cam pulse generator rotor bolts were removed, tighten the rotor bolts to the specified torque.



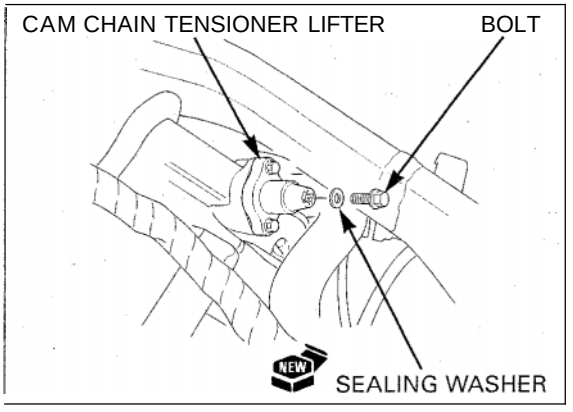
TORQUE: 12 N·m (1.2 kgf·m, 9 lbf·ft)

Remove the cam chain tensioner holder from the cam chain tensioner lifter.

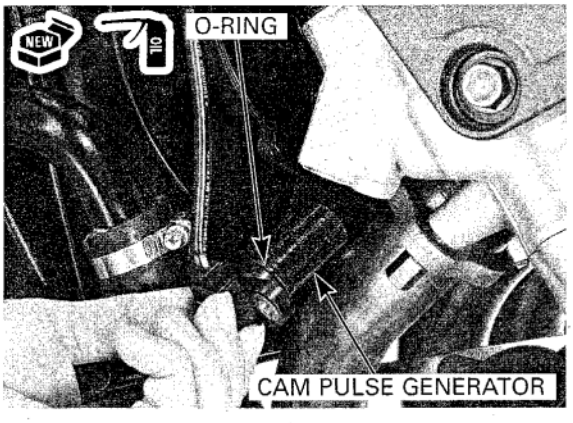


Install a new sealing washer and tighten the sealing bolt.

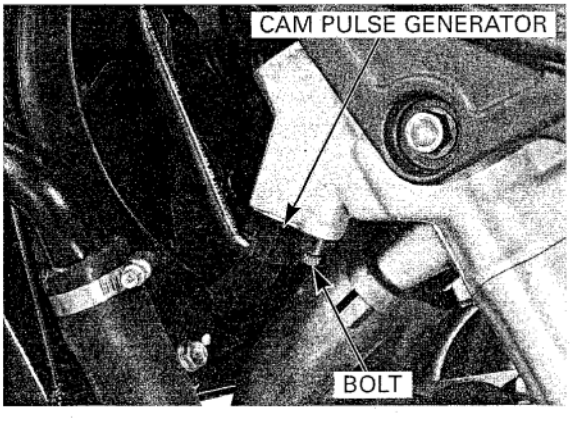
Recheck the valve timing.



Apply oil to the new O-ring, and install it onto the cam pulse generator.
Install the cam pulse generator into the cylinder head.

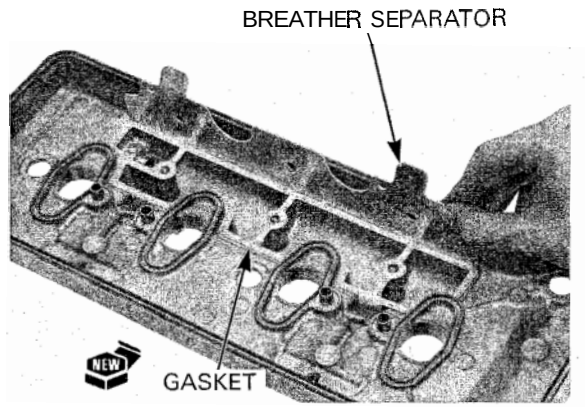


Install and tighten the mounting bolt securely.



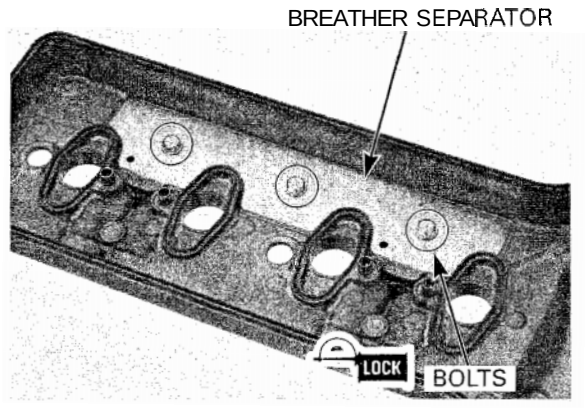
CYLINDER HEAD COVER ASSEMBLY

Install the new gasket and crankcase breather separator to the cylinder head cover.

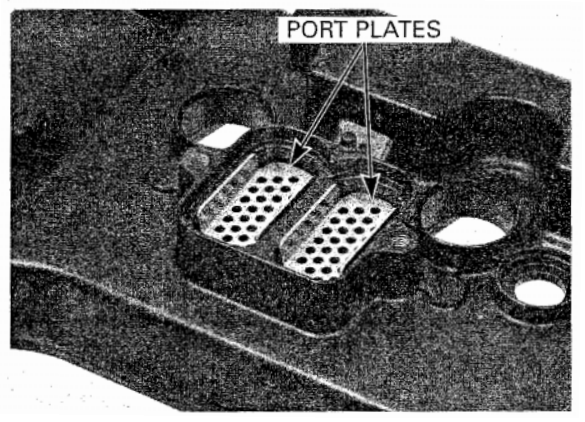


Apply a locking agent to the crankcase breather separator mounting bolt threads.
Install and tighten the bolts to the specified torque.

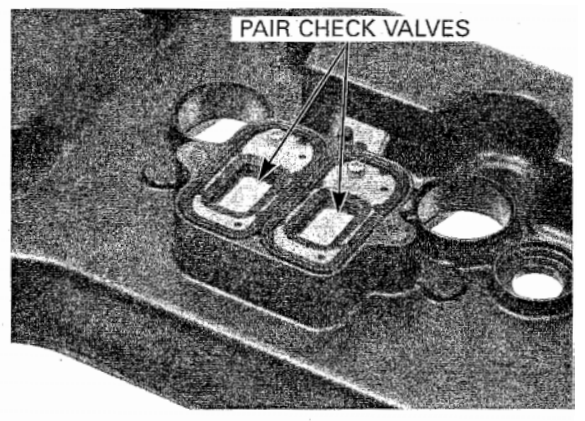
TORQUE: 12 N•m (1.2 kgf•m, 9 lbf•ft)



Install the PAIR check valve port plates into the cylinder head cover.

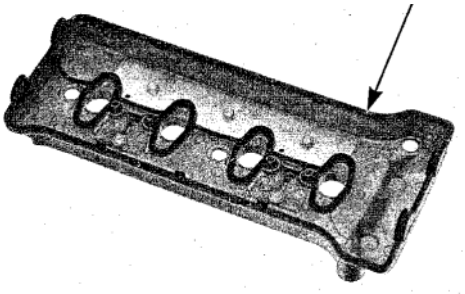


Install the PAIR check valves into the cylinder head cover.

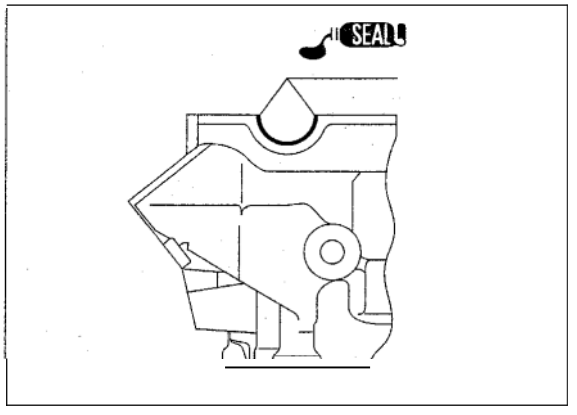


CYLINDER HEAD COVER INSTALLATION

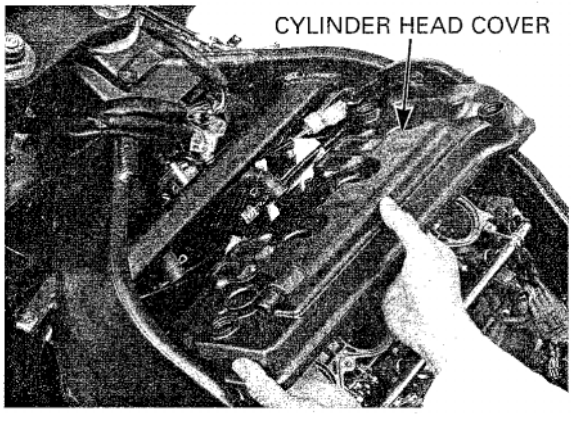
Install the cylinder head packing into the groove of the cylinder head cover.



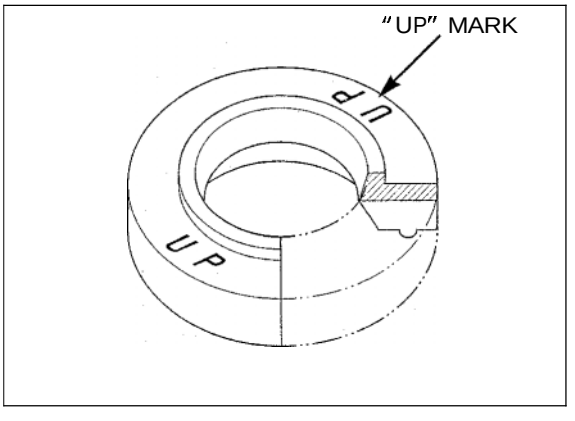
Apply sealant to the cylinder head semi-circular cut-outs as shown.



Install the cylinder head cover onto the cylinder head.

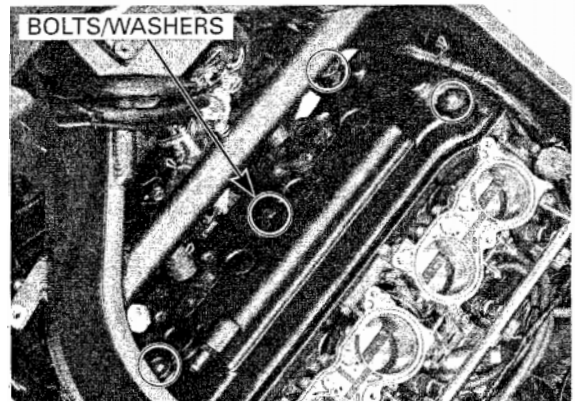


Install the washers with their "UP" mark facing up.



Install and tighten the cylinder head cover special bolts to the specified torque.

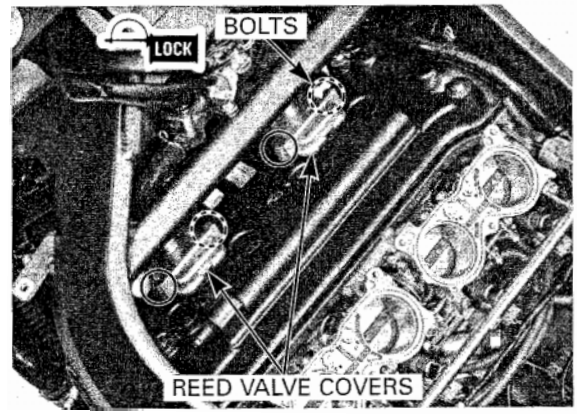
TORQUE: 10 N•m (1.0 kgf•m, 7 lbf•ft)



Install the PAIR reed valve covers onto the cylinder head cover.
Apply a locking agent to the PAIR reed valve cover mounting bolt threads.

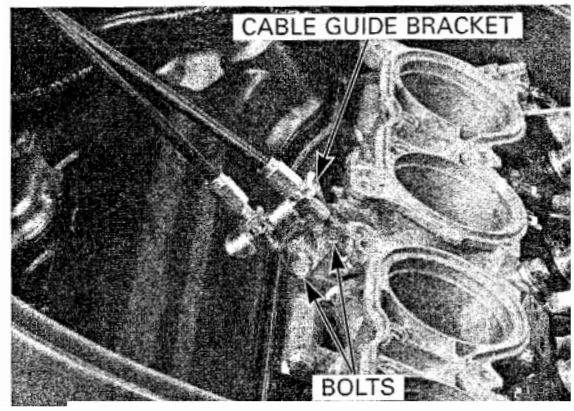
Install and tighten the bolts to the specified torque.

TORQUE: 12 N•m (1.2 kgf•m, 9 lbf•ft)



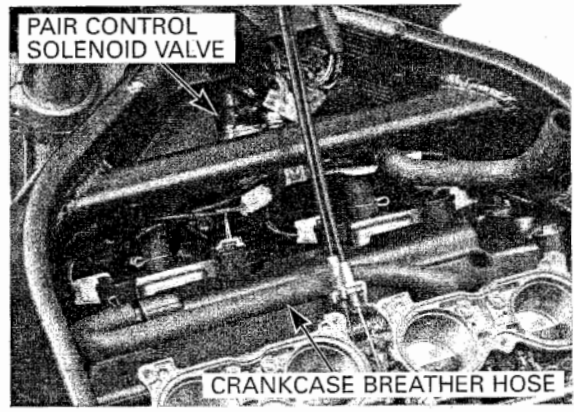
Connect the throttle cables from the throttle drum.
Install and tighten the throttle cable guide bracket mounting bolts to the specified torque.

TORQUE: 3 N•m (0.3 kgf•m, 2.2 lbf•ft)

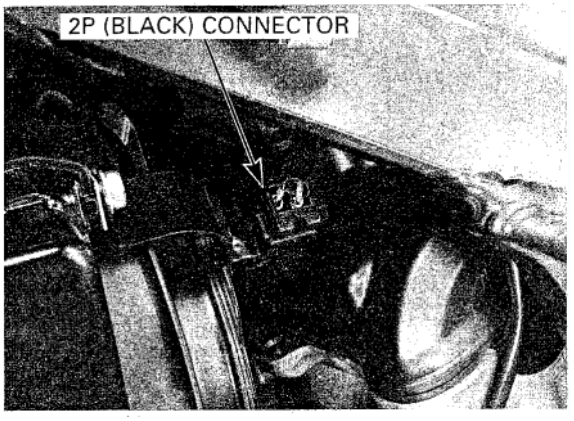


Install the direct ignition coils and spark plug sub-harness (page 17-5).
Connect the cam pulse generator 2P (Natural) connector (page 5-83).
Install the PAIR solenoid valve assembly (page 5-88).
Install and tighten the PAIR solenoid valve mounting bolt.

Connect the crankcase breather hose.

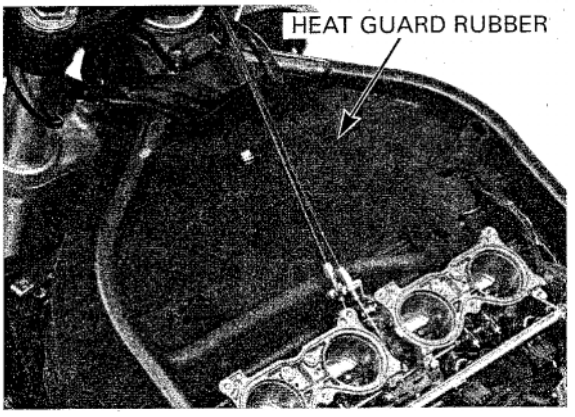


Connect the fan motor 2P (Black) connector.



Install the heat guard rubber onto the cylinder head cover.

Install the air cleaner housing (page 5-65).

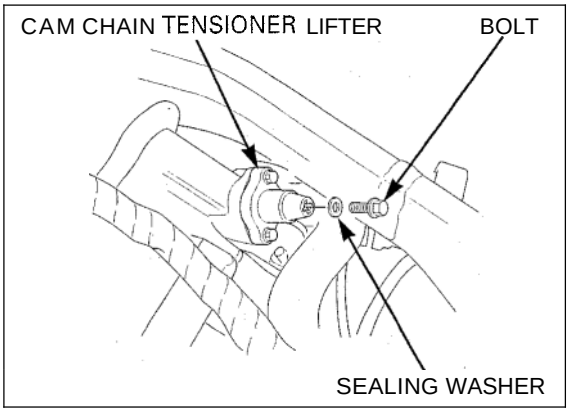


CAM CHAIN TENSIONER LIFTER

REMOVAL

Remove the fuel tank (page 5-59).
Remove the throttle body (page 5-67).

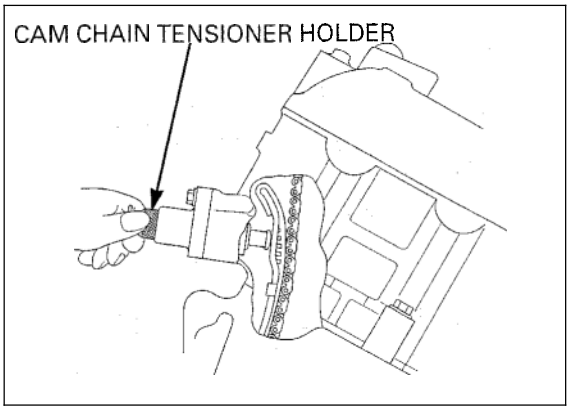
Remove the cam chain tensioner sealing bolt and sealing washer.



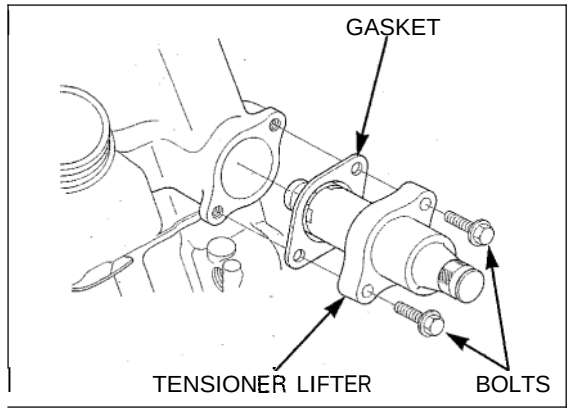
Turn the tensioner shaft fully in (clockwise) and secure it using the cam chain tensioner holder to prevent damaging the cam chain.

TOOL

Cam chain tensioner holder	**07ZMG–MCAA400 (U.S.A. only)**

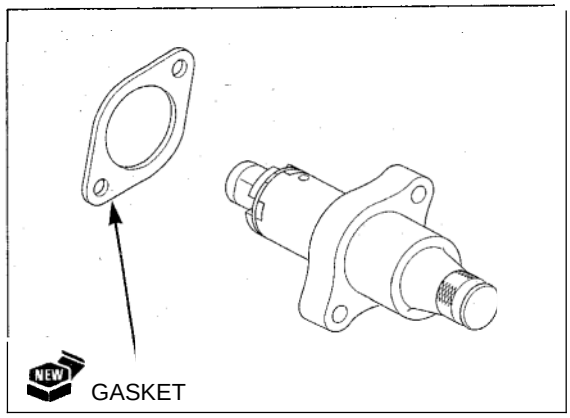


Remove the bolts and cam chain tensioner lifter.
Remove the gasket.

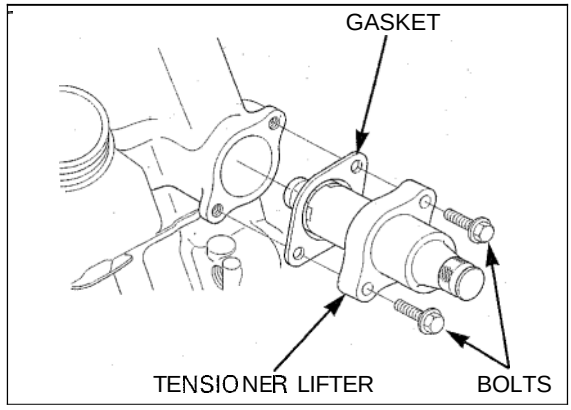


INSTALLATION

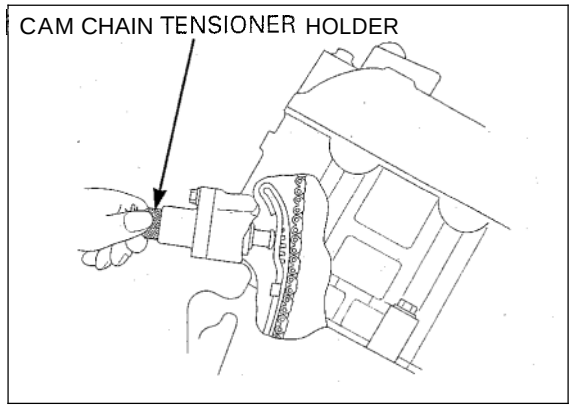
Install the new gasket onto the cam chain tensioner lifter.



Install the cam chain tensioner lifter into the cylinder head.
Install and tighten the mounting bolts.

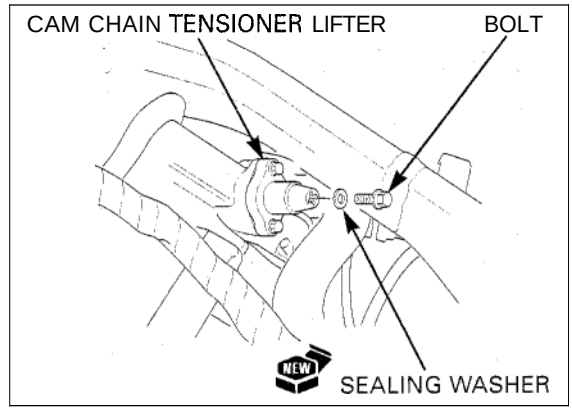


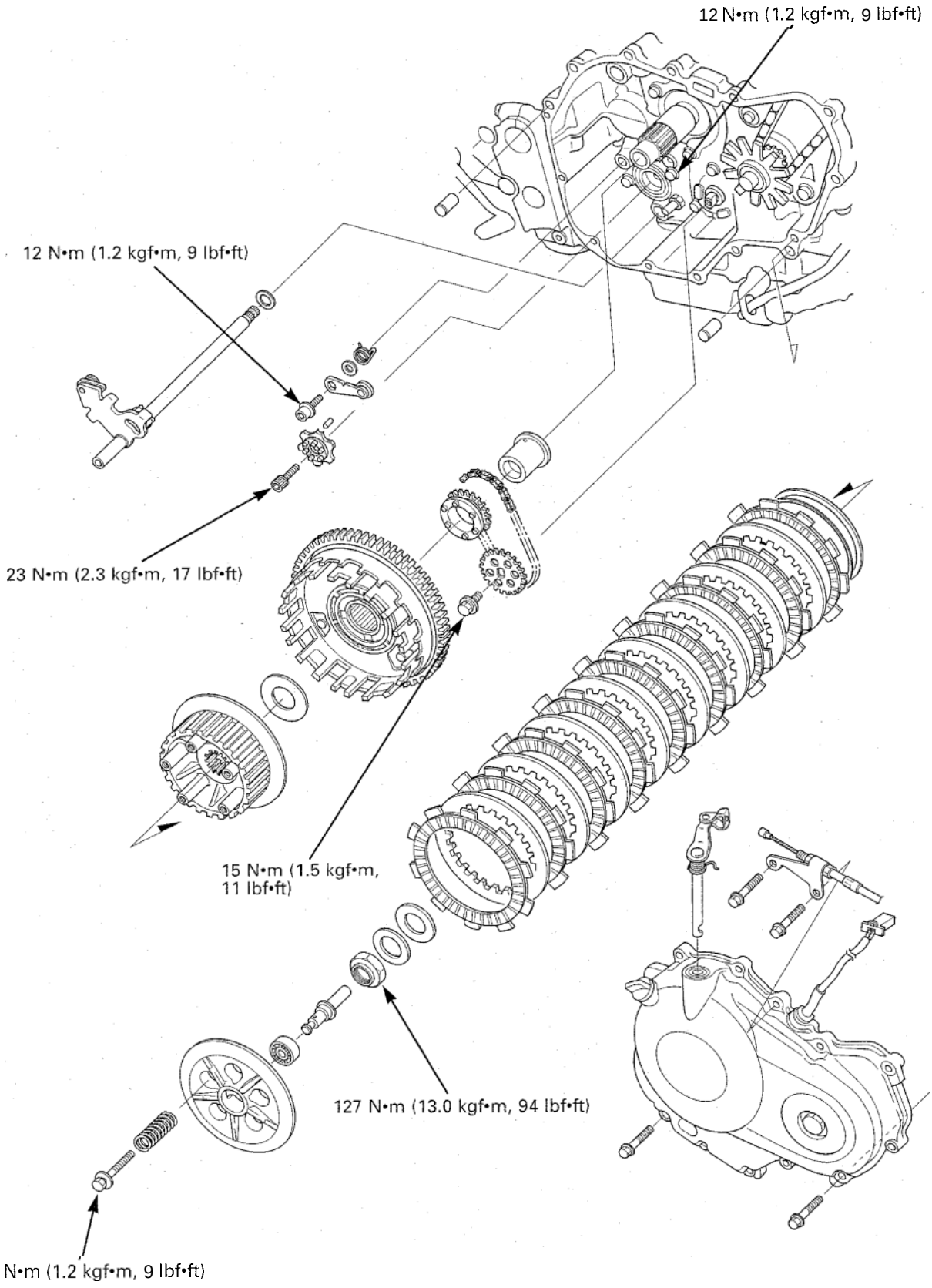
Remove the cam chain tensioner holder.



Install a new sealing washer and tighten the sealing bolt securely.

Install the throttle body (page 5-71).
Install the fuel tank (page 5-61).




12 N•m (1.2 kgf•m, 9 lbf•ft)
12 N•m (1.2 kgf•m, 9 lbf•ft)
23 N•m (2.3 kgf•m, 17 lbf•ft)
15 N•m (1.5 kgf•m, 11 lbf•ft)
127 N•m (13.0 kgf•m, 94 lbf•ft)
12 N•m (1.2 kgf•m, 9 lbf•ft)

9. CLUTCH/GEARSHIFT LINKAGE

SERVICE INFORMATION	9-1	CLUTCH	9-4
TROUBLESHOOTING	9-2	GEARSHIFT LINKAGE	9-12
RIGHT CRANKCASE COVER REMOVAL	9-3	RIGHT CRANKCASE COVER INSTALLATION	9-17

SERVICE INFORMATION

GENERAL

- This section covers service of the clutch, gearshift linkage, shift drum and shift forks. All service can be done with the engine installed in the frame.
- Engine oil viscosity and level have an effect on clutch disengagement. When the clutch does not disengage or the motorcycle creeps with clutch disengaged, inspect the engine oil level before servicing the clutch system.

ITEM			STANDARD	SERVICE LIMIT
Clutch lever free play			10 – 20 (3/8 – 13/16)	—
Clutch spring free length			48.8 (1.92)	47.4 (1.87)
Clutch disc thickness			2.92 – 3.08 (0.114 – 0.121)	2.6 (0.10)
Clutch plate warpage			—	0.30 (0.012)
Clutch outer guide		I.D.	25.000 – 25.021 (0.9843 – 0.9851)	25.03 (0.985)
		O.D.	34.975 – 34.991 (1.3770 – 1.3776)	34.97 (1.377)
Mainshaft O.D. at clutch outer guide			24.980 – 24.993 (0.9835 – 0.9840)	24.96 (0.983)
Shift fork, fork shaft	Fork	I.D.	12.000 – 12.018 (0.4724 – 0.4731)	12.03 (0.474)
		Claw thickness	5.93 – 6.00 (0.233 – 0.236)	5.9 (0.23)
	Fork shaft O.D.		11.957 – 11.968 (0.4707 – 0.4712)	11.95 (0.470)

TORQUE VALUES

Clutch center lock nut	127 N•m (13.0 kgf•m, 94 lbf•ft)	Apply oil to the threads. Stake the nut.
Clutch spring bolt	12 N•m (1.2 kgf-m, 9 lbf•ft)	
Shift drum center socket bolt	23 N•m (2.3 kgf-m, 17 lbf•ft)	Apply a locking agent to the threads.
Shift drum stopper arm pivot bolt	12 N•m (1.2 kgf-m, 9 lbf•ft)	
Gearshift return spring pin	23 N•m (2.3 kgf-m, 17 lbf•ft)	
Gearshift drum bearing/shift fork shaft retaining bolt	12 N•m (1.2 kgf-m, 9 lbf•ft)	Apply a locking agent to the threads.
Gearshift pedal link pinch bolt	10 N•m (1.0 kgf-m, 7 lbf•ft)	
Oil pump driven sprocket bolt	15 N•m (1.5 kgf-m, 11 lbf•ft)	Apply a locking agent to the threads.

TOOLS

Clutch center holder	07724–0050002	or equivalent commercially available in U.S.A.
Driver	07749–0010000	
Attachment, 42 x 47 mm	07746–0010300	
Pilot, 35 mm	07746–0040800	

TROUBLESHOOTING

Clutch lever too hard to pull in
- Damaged clutch lifter mechanism
- Faulty clutch lifter bearing
- Clutch lifter piece installed improperly

Clutch slips when accelerating
- Worn clutch disc
- Weak clutch springs
- Transmission oil mixed with molybdenum or graphite additive

Clutch will not disengage or motorcycle creeps with clutch disengaged
- Clutch plate warped
- Loose clutch lock nut
- Oil level too high
- Improper oil viscosity
- Damaged clutch lifter mechanism
- Clutch lifter piece installed improperly

Hard to shift
- Improper clutch operation
- Improper oil viscosity
- Bent shift fork
- Bent shift fork shaft
- Bent fork claw
- Damaged shift drum cam groove
- Loose stopper plate bolt
- Damaged stopper plate and pin
- Damaged gearshift spindle

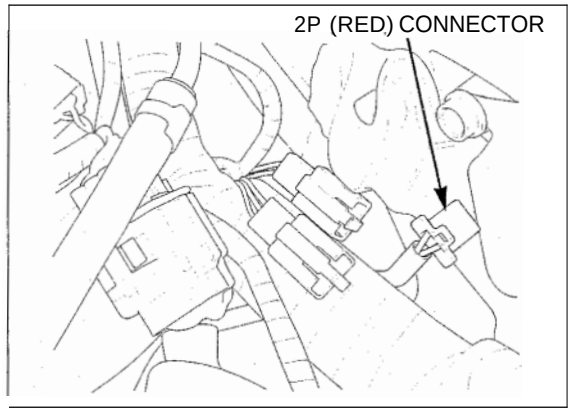
Transmission jumps out of gear
- Worn shift drum stopper arm
- Weak or broken shift arm return spring
- Loose stopper plate bolt
- Bent shift fork shaft
- Damaged shift drum cam groove
- Damaged or bent shift forks
- Worn gear engagement dogs or slots

Gearshift pedal will not return
- Weak or broken gearshift spindle return spring
- Bent gearshift spindle

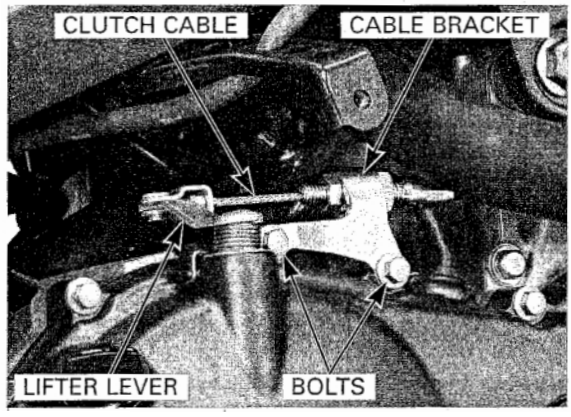
RIGHT CRANKCASE COVER REMOVAL

Drain the engine oil (page 3-15).
Remove the lower cowl (page 2-7).
Open and support the front end of the fuel tank (page 3-4).

Disconnect the ignition pulse generator 2P (Red) connector.

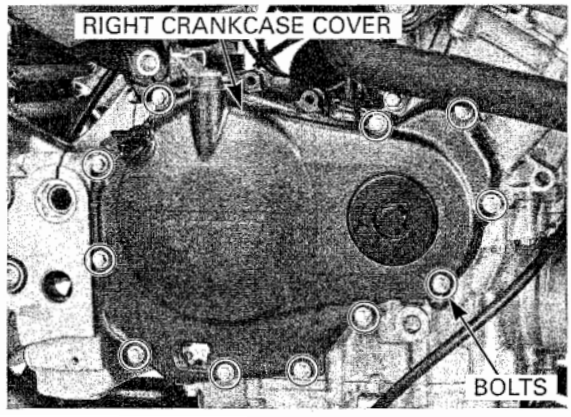


Remove the bolts and clutch cable bracket, then disconnect the clutch cable end from the clutch lifter lever.



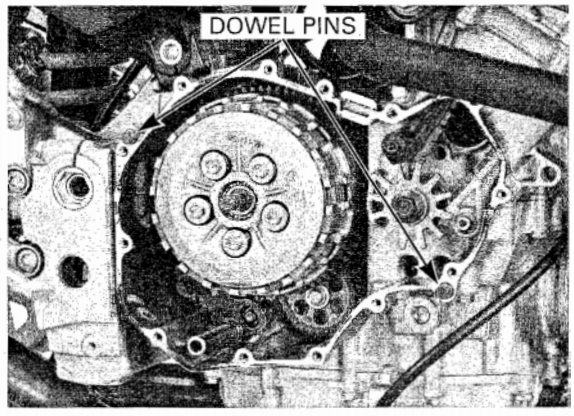
The lifter arm spindle is engaged with the clutch lifter piece inside the right crankcase cover

Remove the right crankcase cover SH bolts.
Remove the right crankcase cover while turning the clutch lifter arm counterclockwise to disengage the lifter arm spindle from the lifter piece.



Remove the two dowel pins.

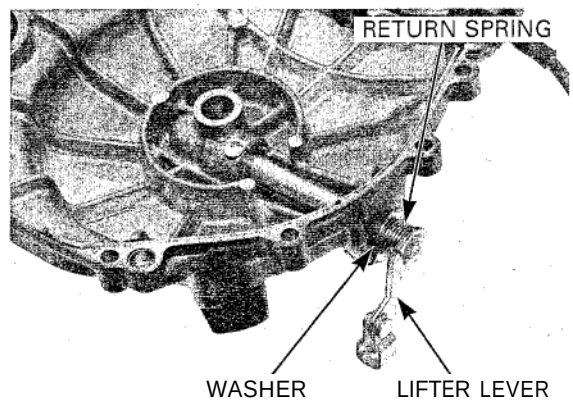
Clean any sealant off from the right crankcase cover mating surfaces.



CLUTCH LIFTER LEVER

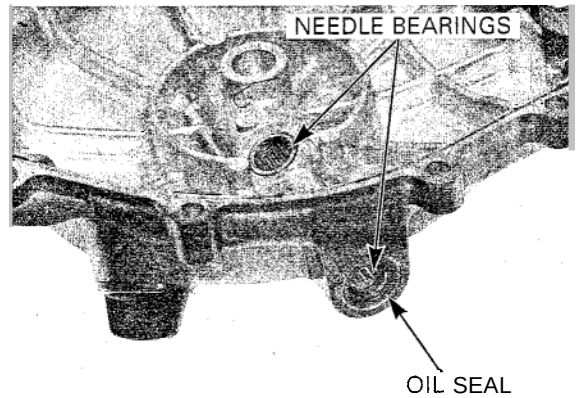
Remove the clutch lifter lever, return spring and washer from the right crankcase cover.

Check the lifter lever spindle for wear or damage.
Check the return spring for fatigue or damage.



Check the lifter lever oil seal and needle bearings for wear or damage.
Install the clutch lifter lever with the washer and spring in the reverse order of removal.

Install the hooks of the return spring to the right crankcase cover and clutch lifter lever.



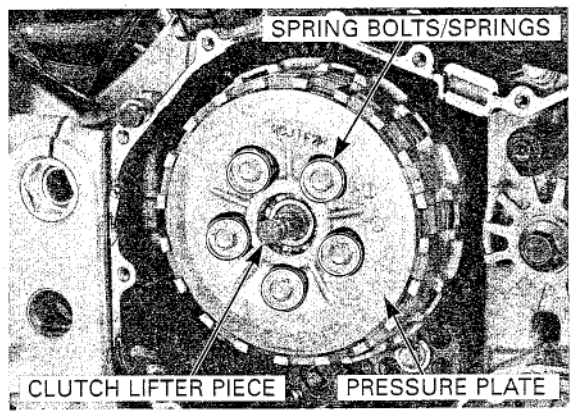
CLUTCH

REMOVAL

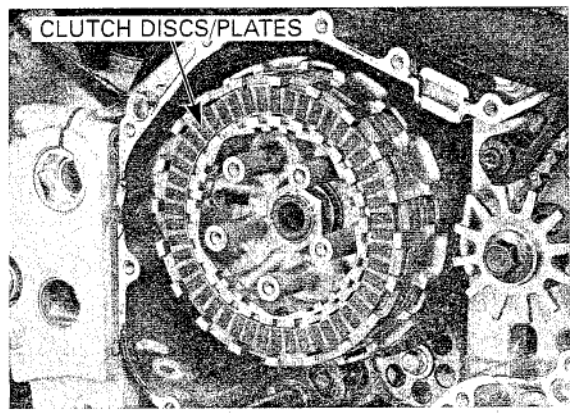
Remove the right crankcase cover (page 9-3).

Remove the clutch spring bolts, springs and pressure plate.

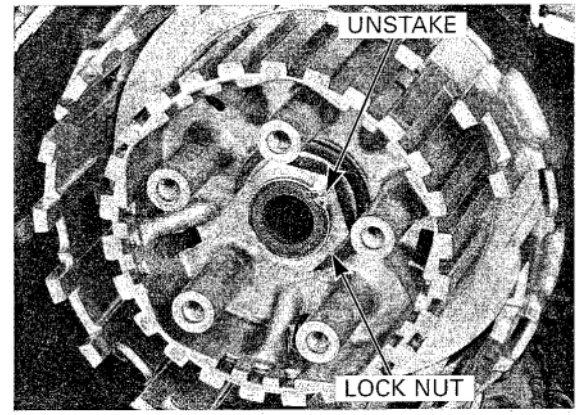
Remove the clutch lifter piece from the lifter bearing.



Remove the following:
- Nine clutch discs
- Eight clutch plates
- Judder spring
- Judder spring seat



Unstake the clutch center lock nut.

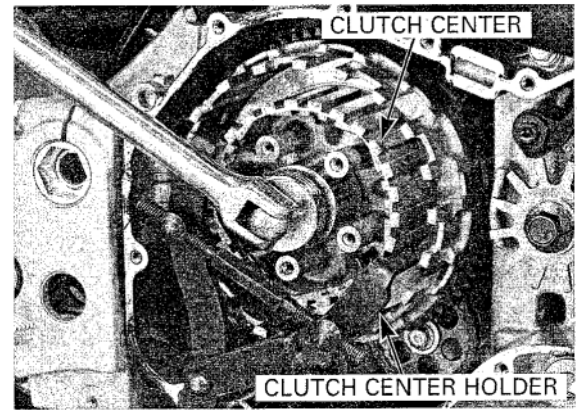


Hold the clutch center with the clutch center holder, then remove the lock nut.

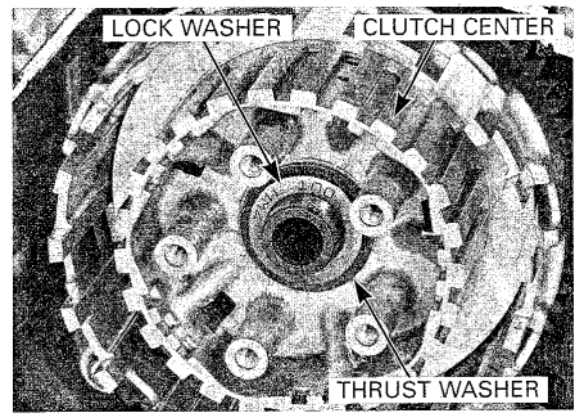
TOOL:

Clutch center holder	**07724–0050002 (Equivalent commercially available in U.S.A.)**

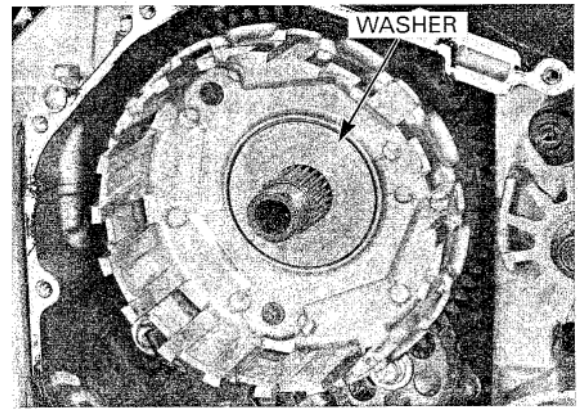
Discard the lock nut.



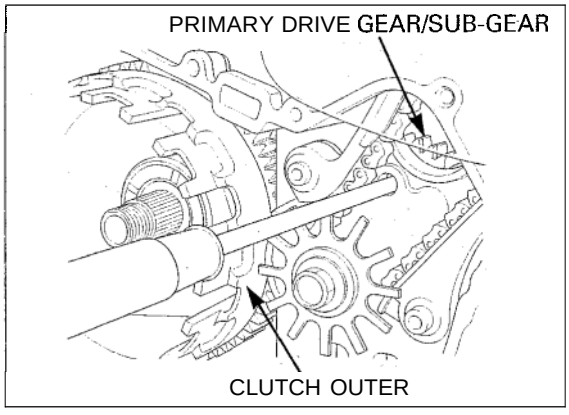
Remove the lock washer, thrust washer and clutch center.



Remove the washer.

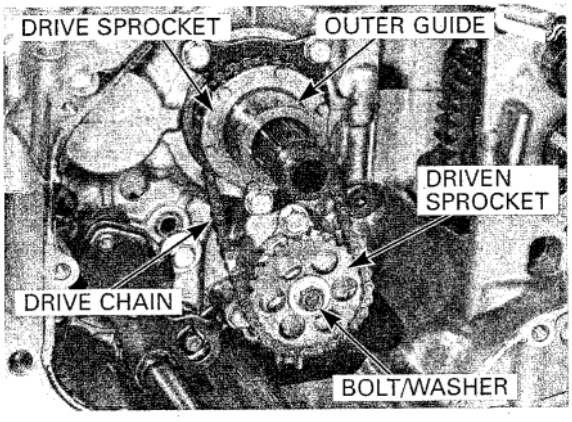


Align the primary drive gear and sub-gear teeth with a screwdriver as shown.
Pull out the clutch outer.



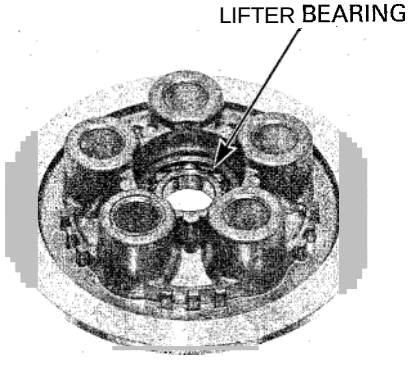
Remove the oil pump driven sprocket bolt/washer.
Remove the oil pump drive/driven sprocket and drive chain as an assembly.

Remove the clutch outer guide.



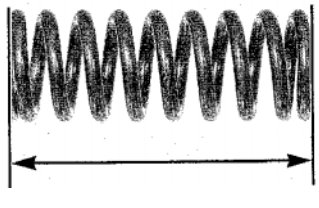
INSPECTION

Clutch lifter bearing
Turn the inner race of the lifter bearing with your finger.
The bearing should turn smoothly and freely without excessive play.
If necessary replace the bearing.

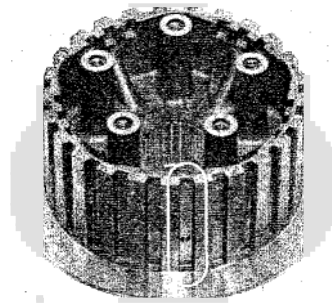


Clutch spring
Measure the clutch spring free length.

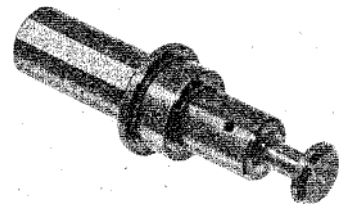
SERVICE LIMIT: 47.4 mm (1.87 in)



Clutch center
Check the grooves of the clutch center for damage or wear caused by the clutch plates.
Replace if necessary.



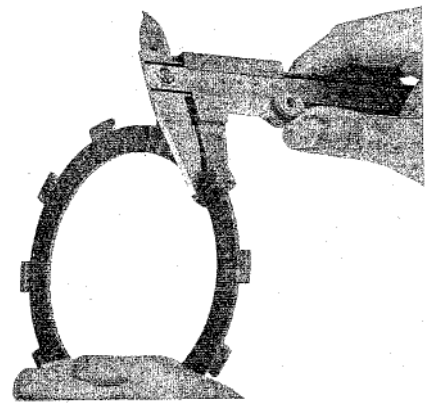
Clutch lifter piece
Check the clutch lifter piece for damage or abnormal wear.



Clutch disc
Replace the clutch discs if they show signs of scoring or discoloration.

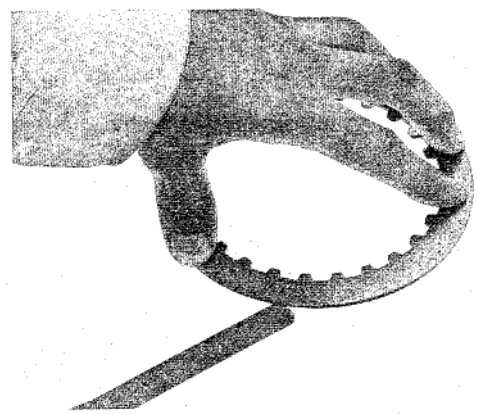
Measure the disc thickness of each disc.

SERVICE LIMIT: 2.6 mm (0.10 in)



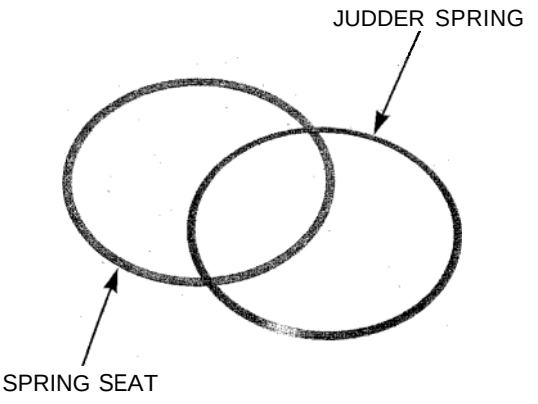
Clutch plate
Check each disc plate for warpage on a surface plate using a feeler gauge.

SERVICE LIMIT: 0.30 mm (0.012 in)

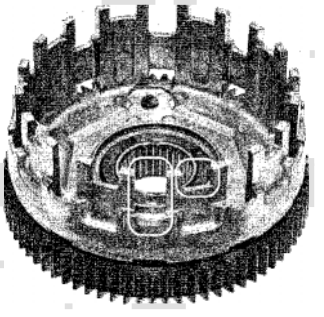


Judder spring/spring seat
Check the judder spring and spring seat for deformation, warpage or damage; replace as necessary.

- A damaged or warped spring seat will cause the judder spring to be pressed unevenly.
- A damaged judder spring also causes the weak contact between the discs and plates or uneven disc/plate contact.

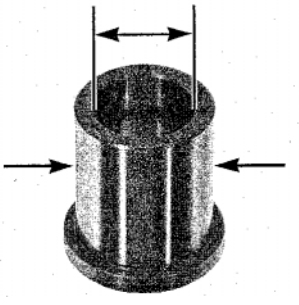


Clutch outer/clutch outer guide
Check the slots of the clutch outer for damage or wear caused by the clutch discs.
Replace if necessary.



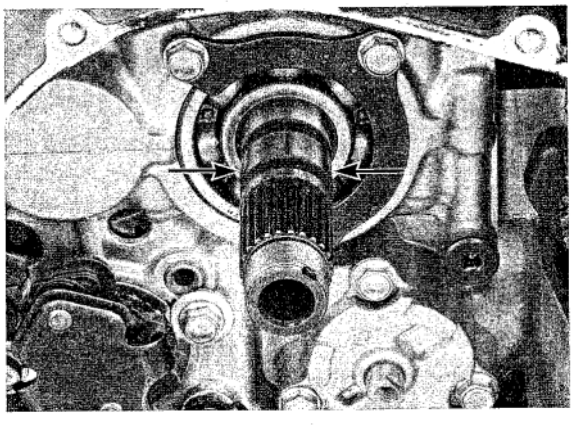
Measure the O.D. and I.D. of the clutch outer guide.

SERVICE LIMITS:
O.D.: 34.97 mm (1.377 in)
I.D.: 25.03 mm (0.985 in)



Mainshaft
Measure the mainshaft O.D. at clutch outer guide sliding surface.

SERVICE LIMIT: 24.96 mm (0.983 in)

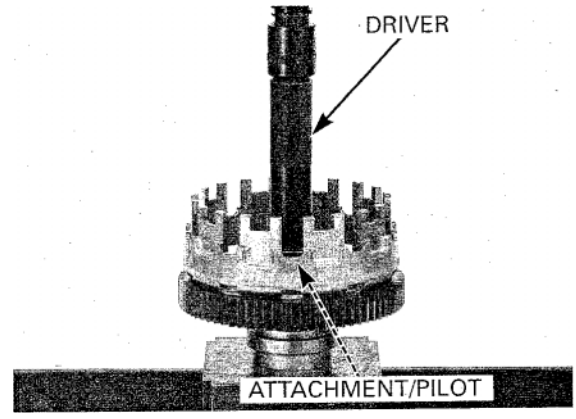


CLUTCH OUTER NEEDLE BEARING REPLACEMENT

Press the needle bearing out of the clutch outer using the special tools.

TOOLS:

Driver	**07749–0010000**
Attachment, 42 X 47 mm	**07746–0010300**
Pilot, 35 mm	**07746–0040800**

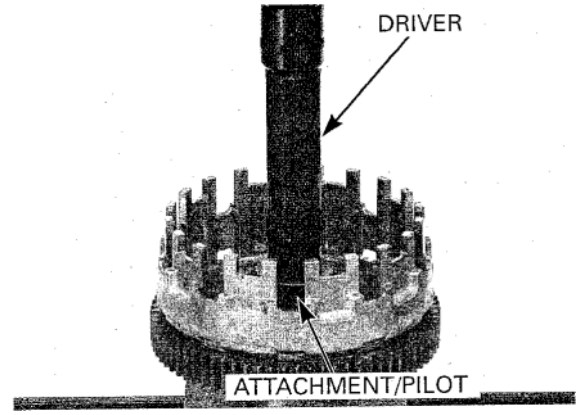


Press the needle bearing into the clutch outer with the marked side facing up

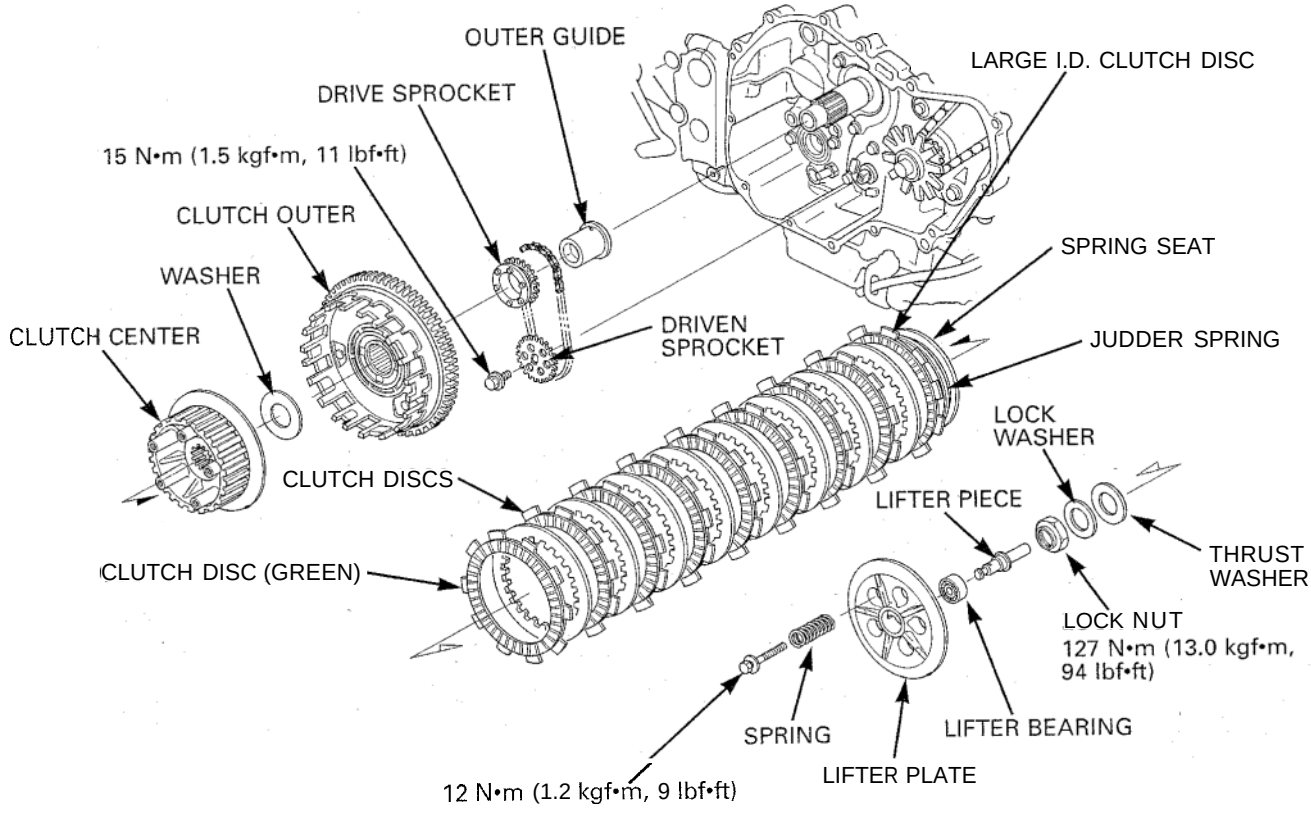
Press a new needle bearing into the clutch outer so that the casing of the needle bearing is flush with the clutch outer surface as shown.

TOOLS:

Driver	**07749–0010000**
Attachment, 42 X 47 mm	**07746–0010300**
Pilot, 35 mm	**07746–0040800**

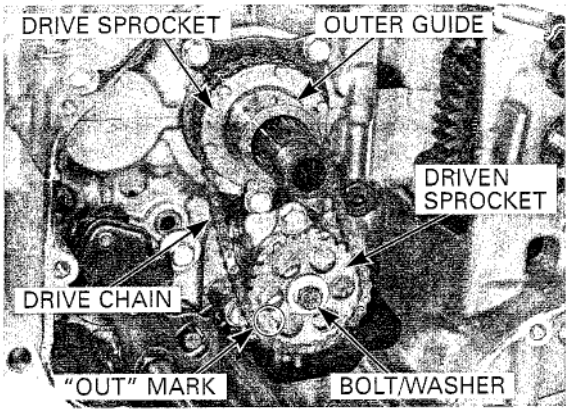


INSTALLATION



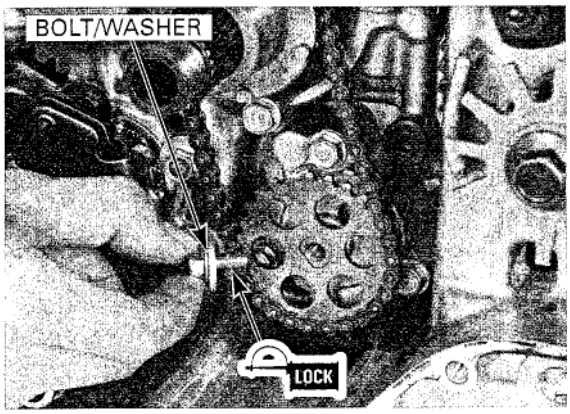
install the oil pump driven sprocket with its "OUT" mark facing out

Install the clutch outer guide, and then install the oil pump drive/driven sprocket and drive chain as an assembly.



Apply a locking agent to the threads of the oil pump driven sprocket bolt.
Tighten the driven sprocket bolt to the specified torque.

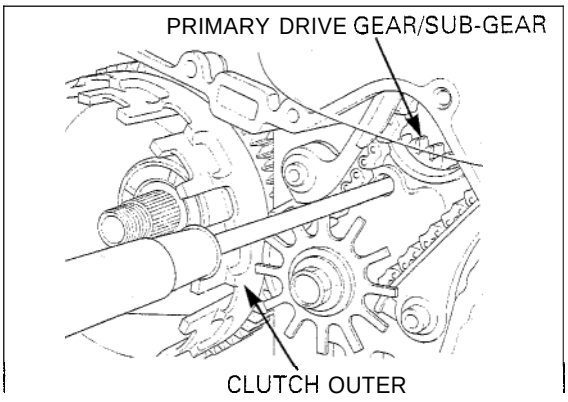
TORQUE: 15 N•m (1.5 kgf•m, 11 lbf•ft)



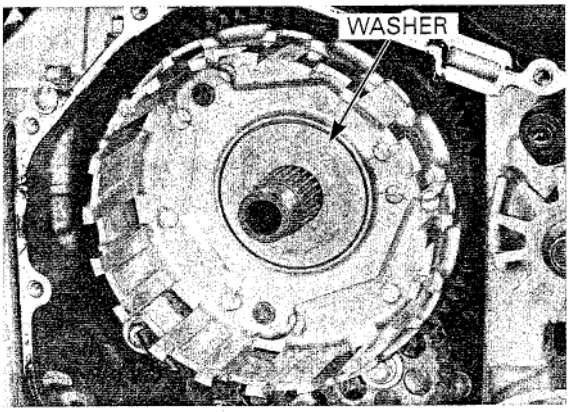
Be sure the clutch outer sits securely onto the positioning tabs of the oil pump drive sprocket. Rotate the oil pump drive chain while installing the clutch outer to properly seat it.

Align the primary drive gear and sub-gear teeth with a screwdriver as shown.

Install the clutch outer.

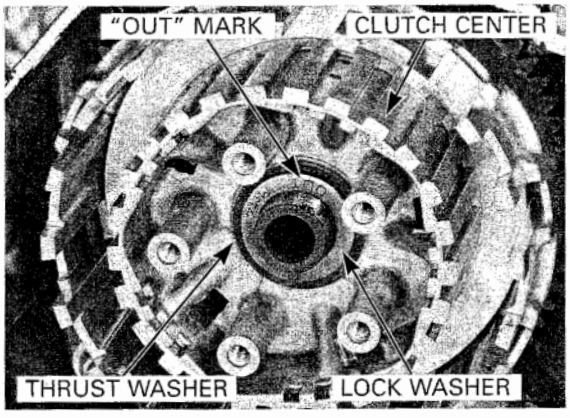


Install the washer onto the clutch outer.



Install the clutch center.

Install the thrust washer.
Install the lock washer with its "OUT" mark facing out.

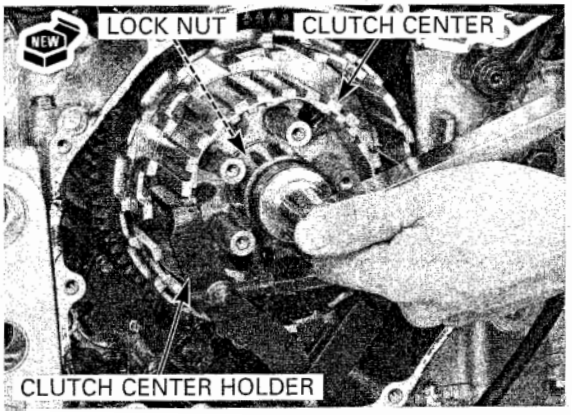


Apply oil to the new lock nut threads, then install it.

Hold the clutch center with the clutch center holder, then tighten the lock nut to the specified torque.

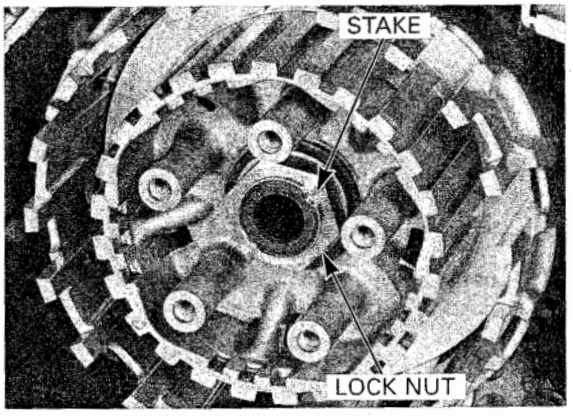
TOOL:
Clutch center holder **07724–0050002**
(Equivalent commercially available in U.S.A.)

TORQUE: 127 N·m (13.0 kgf·m, 94 lbf·ft)



Be careful not to damage the mainshaft threads.

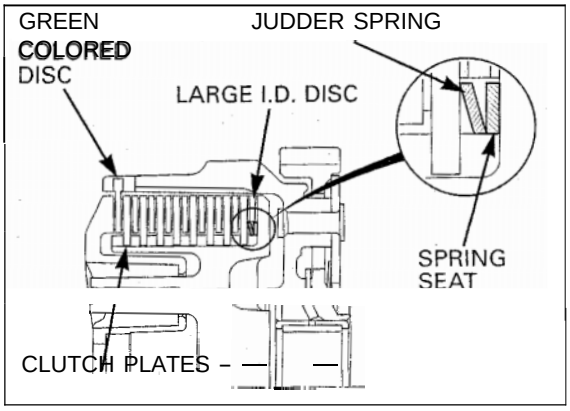
Stake the lock nut into the mainshaft groove with a punch.



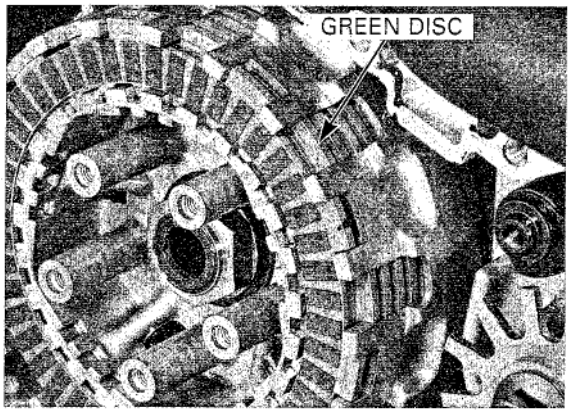
Install the judder spring seat and judder spring.

Coat the clutch discs and plates with clean engine oil.
Install the large I.D. clutch disc.

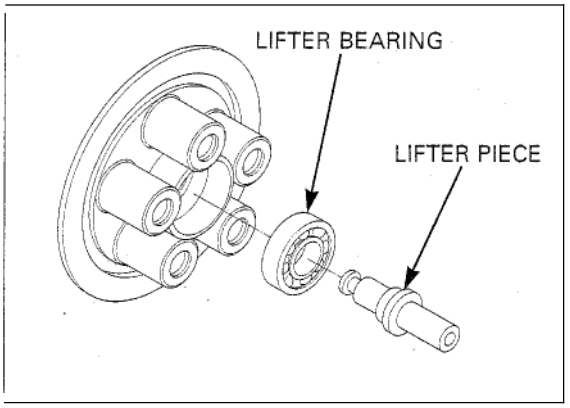
Stack the clutch plates and discs alternately.



Install the green outer clutch disc in the shallow slot on the clutch outer.



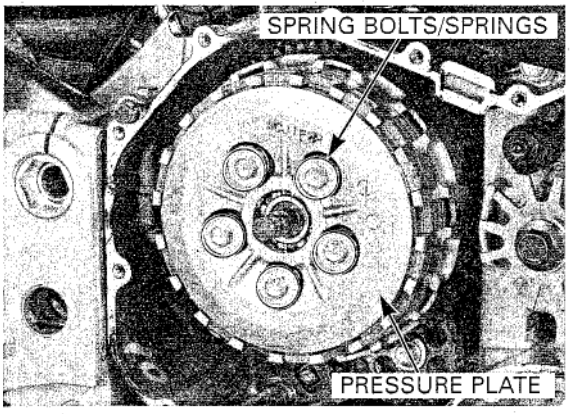
Install the lifter bearing into the pressure plate.
Install the clutch lifter piece into the lifter bearing.



Install the pressure plate.
Install the clutch springs and spring bolts.
Tighten the bolts in a crisscross pattern in two to three steps, then tighten the bolts to the specified torque.

TORQUE: 12 N·m (1.2 kgf·m, 9 lbf·ft)

Install the right crankcase cover (page 9-17).

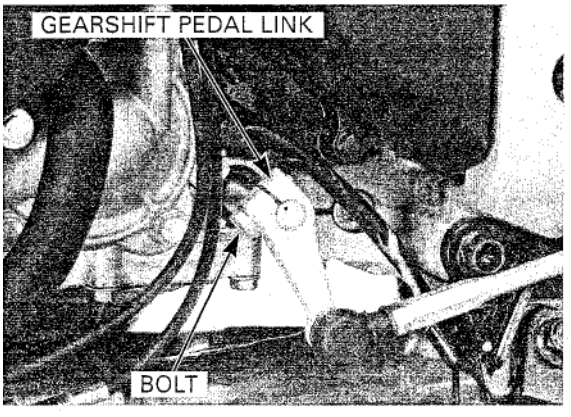


GEARSHIFT LINKAGE

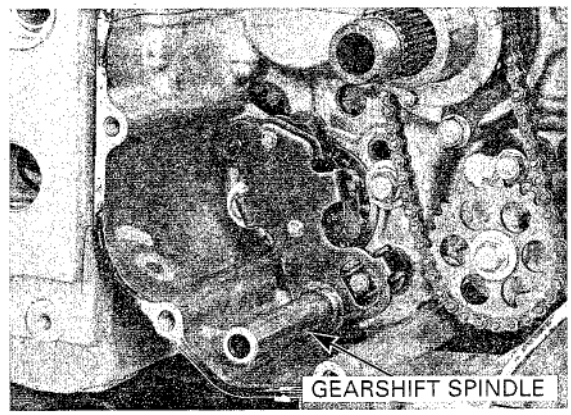
GEARSHIFT LINKAGE REMOVAL

Remove the following:
- Right crankcase cover (page 9-3)
- Clutch assembly (page 9-4)

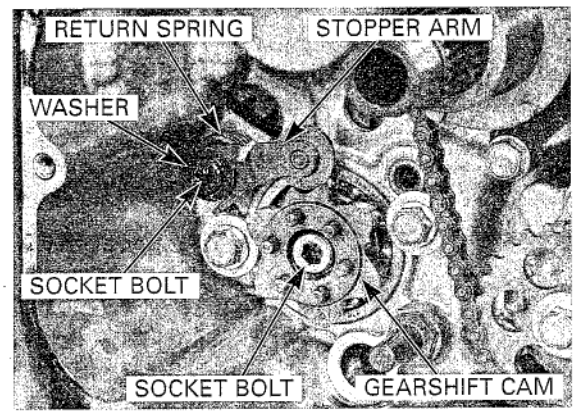
Remove the bolt and gearshift pedal link.



Pull the gearshift spindle assembly and thrust washer out of the crankcase.

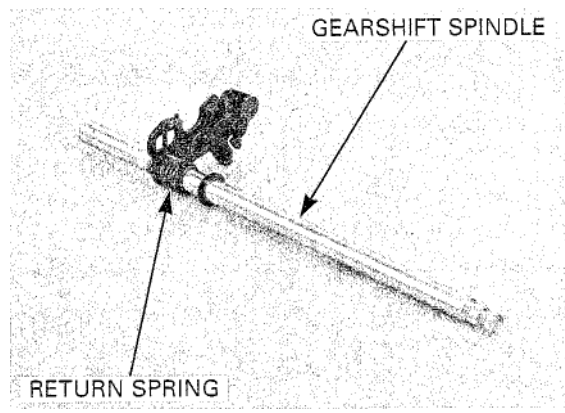


Remove the following:
- Stopper arm socket bolt
- Stopperarm
- Return spring
- Washer
- Dowel pins
- Socket bolt
- Gearshift cam



GEARSHIFT LINKAGE INSPECTION

Check the gearshift spindle for wear, damage or bends.
Check the return spring for fatigue or damage.

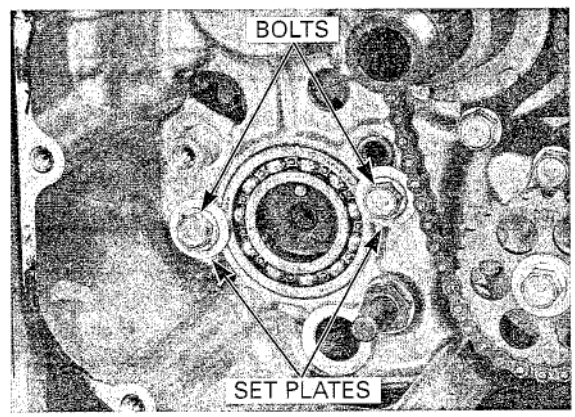


Shift drum/shift fork service can be done with the engine installed in the frame.

SHIFT DRUM/SHIFT FORK REMOVAL

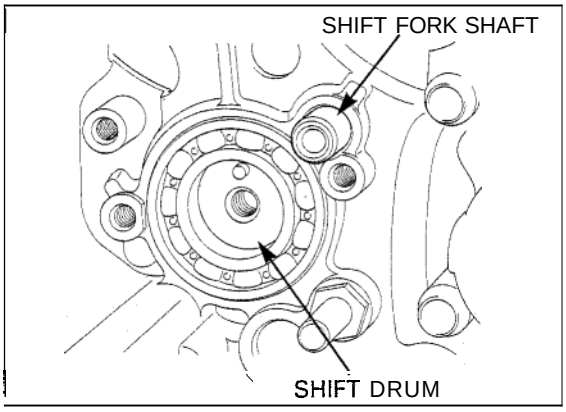
Remove the following:
- Gearshift linkage (page 9-12)
- Oil pan (page 4-3)

Remove the bolts and shift drum bearing set plates.



Remove the shift fork shaft and shift forks.

Remove the shift drum bearing and shift drum.



SHIFT DRUM/SHIFT FORK INSPECTION

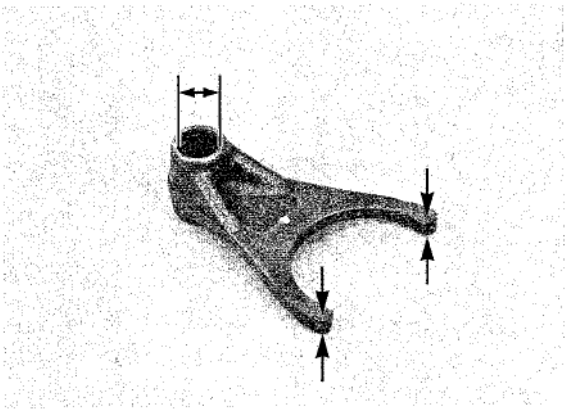
Check the shift fork and fork shaft for wear or damage.

Measure the I.D. of the shift fork.

SERVICE LIMIT: 12.03 mm (0.474 in)

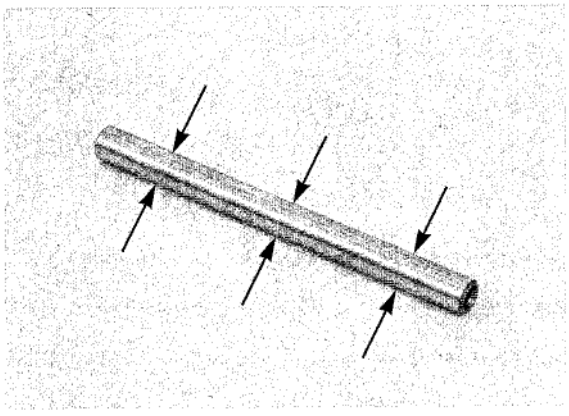
Measure the shift fork claw thickness.

SERVICE LIMIT: 5.9 mm (0.23in)

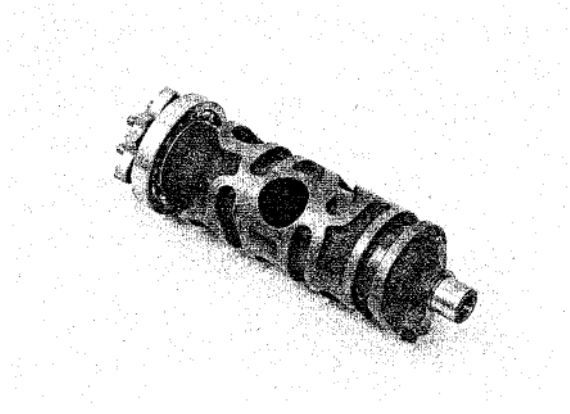


Measure the O.D. of the shift fork shaft.

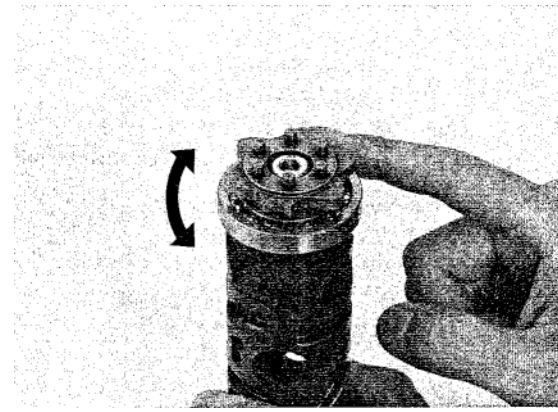
SERVICE LIMIT: 11.95 mm (0.470in)



Inspect the shift drum grooves for wear or damage.

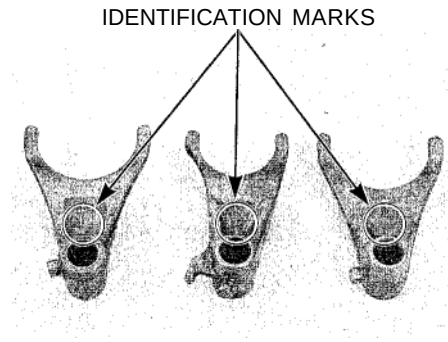


Turn the outer race of the shift drum bearing with your finger.
The bearing should turn smoothly and freely without excessive play.
If necessary replace the bearing.



SHIFT DRUM/SHIFT FORK INSTALLATION

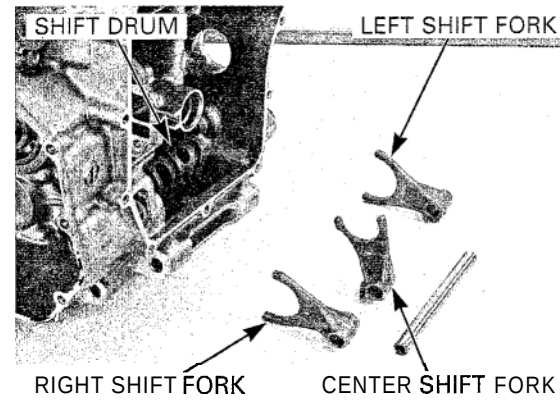
The shift forks have location marks.
"R" for right
"C" for center
"L" for left



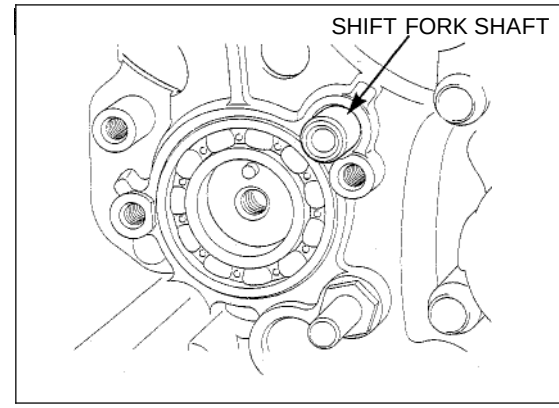
Install the shift drum/shift drum bearing into the crankcase.

Apply molybdenum disulfide oil to the shifter fork groove of the shift gears.

Install the shift forks on the transmission with their identification marks facing to the right.



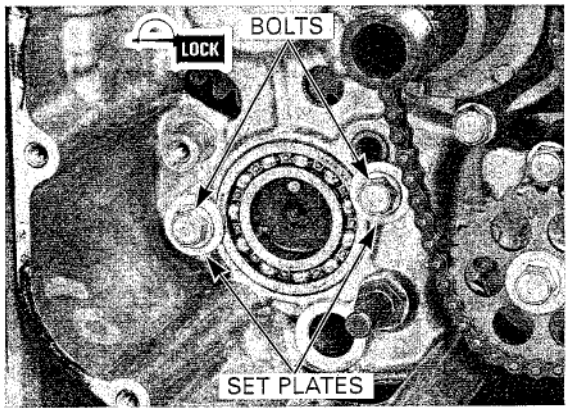
Install the shift fork shaft.



Apply a locking agent to the threads of the set plate bolts.
Install and set plates and bolts, tighten the bolts to the specified torque.

TORQUE: 12 N•m (1.2 kgf-m, 9 lbf•ft)

Install the gearshift linkage (see following steps).

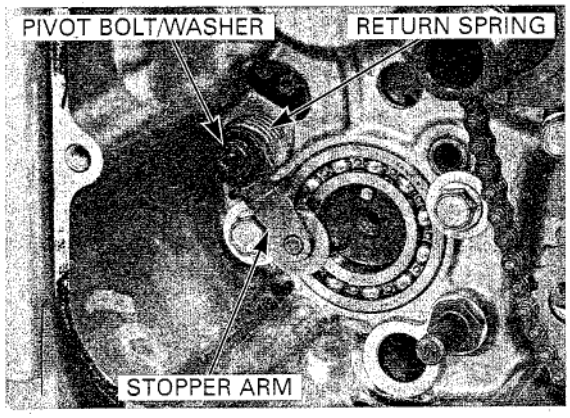


GEARSHIFT LINKAGE INSTALLATION

Install the following:
- Washer
- Return spring
- Stopper arm
- Socket bolt

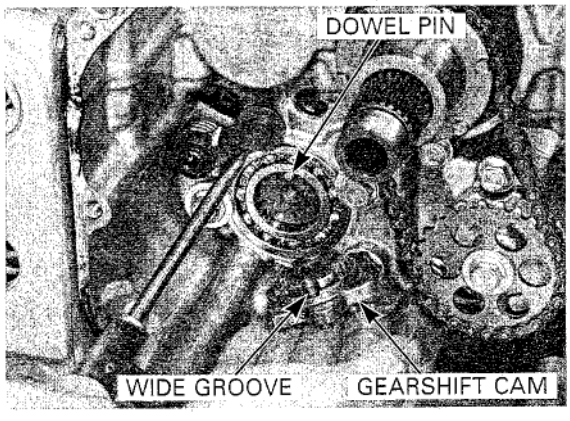
Tighten the stopper arm socket bolt to the specified torque.

TORQUE: 12 N•m (1.2 kgf•m, 9 lbf•ft)



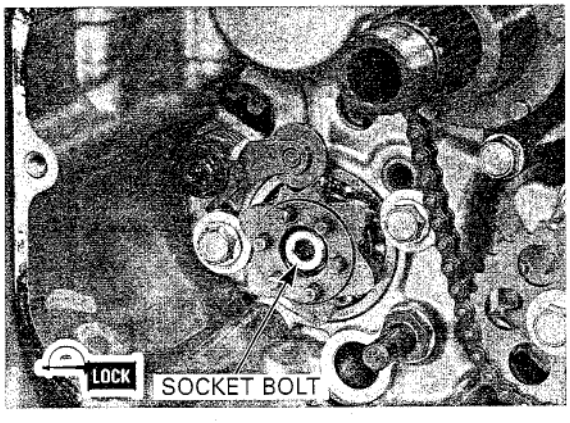
Align the dowel pin on the shift drum center with the wide groove on rhe gearshift cam

Install the dowel pin onto the shift drum.
Install the gearshift cam while holding the stopper arm using a screwdriver as shown.

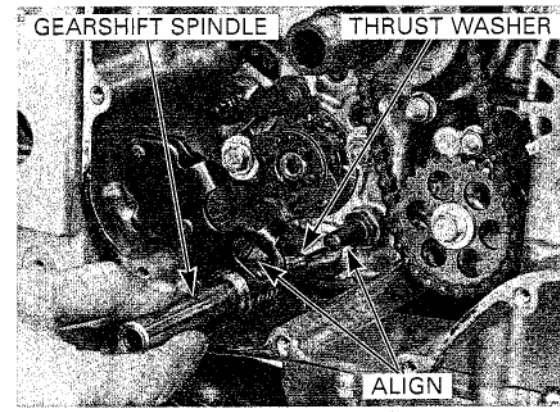


Apply a l cking gent o the gearshift cam socket bolt threads.
Install and tighten the socket bolt to the specified torque.

TORQUE: 23 N•m (2.3 kgf•m, 17 lbf•ft)



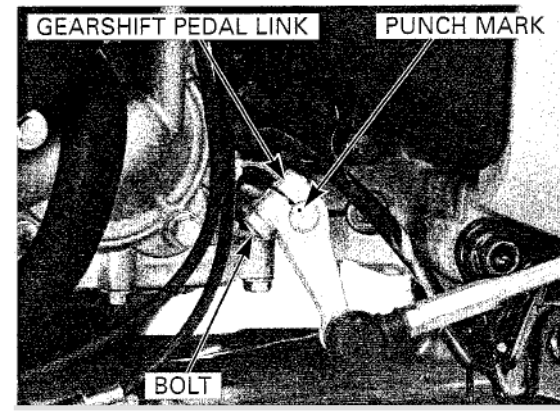
Install the thrust washer and gearshift spindle assembly into the crankcase while aligning the spring ends with the crankcase stopper pin.



Install the gearshift pedal link aligning its slit with the punch mark on the gearshift spindle.
Install and tighten the pinch bolt to the specified torque.

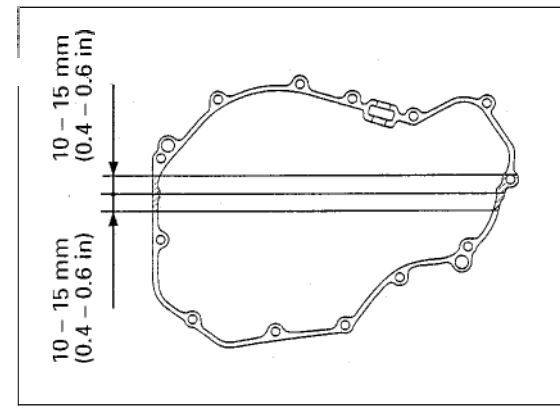
TORQUE: 10 N·m (1.0 kgf·m, 7 lbf·ft)

Install the clutch assembly (page 9-9).

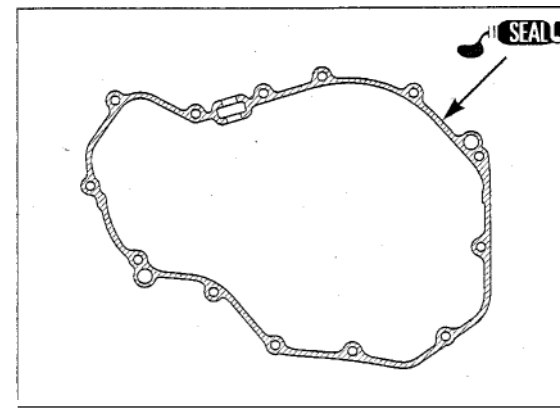


RIGHT CRANKCASE COVER INSTALLATION

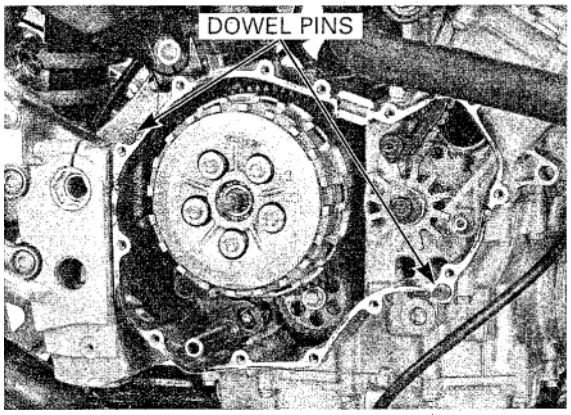
Apply sealant to the mating surfaces of the crankcase as shown.



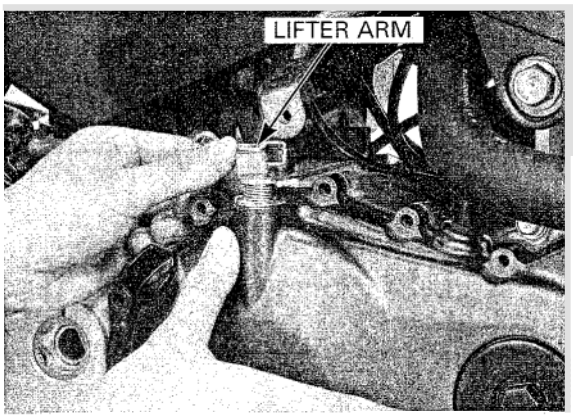
Apply sealant to the mating surface of the right crankcase cover.



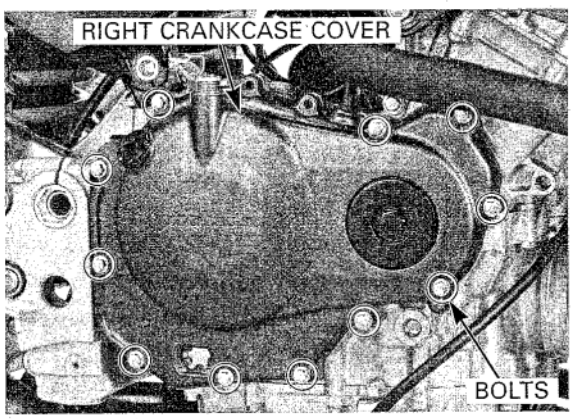
Install the two dowel pins.



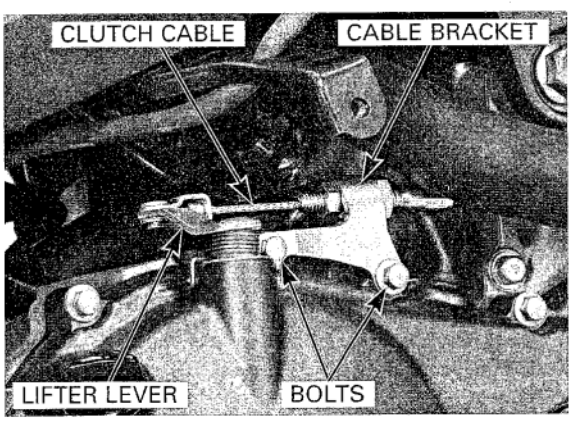
Install the right crankcase cover while turning the lifter arm clockwise to engage the lifter arm groove with the lifter piece flange.

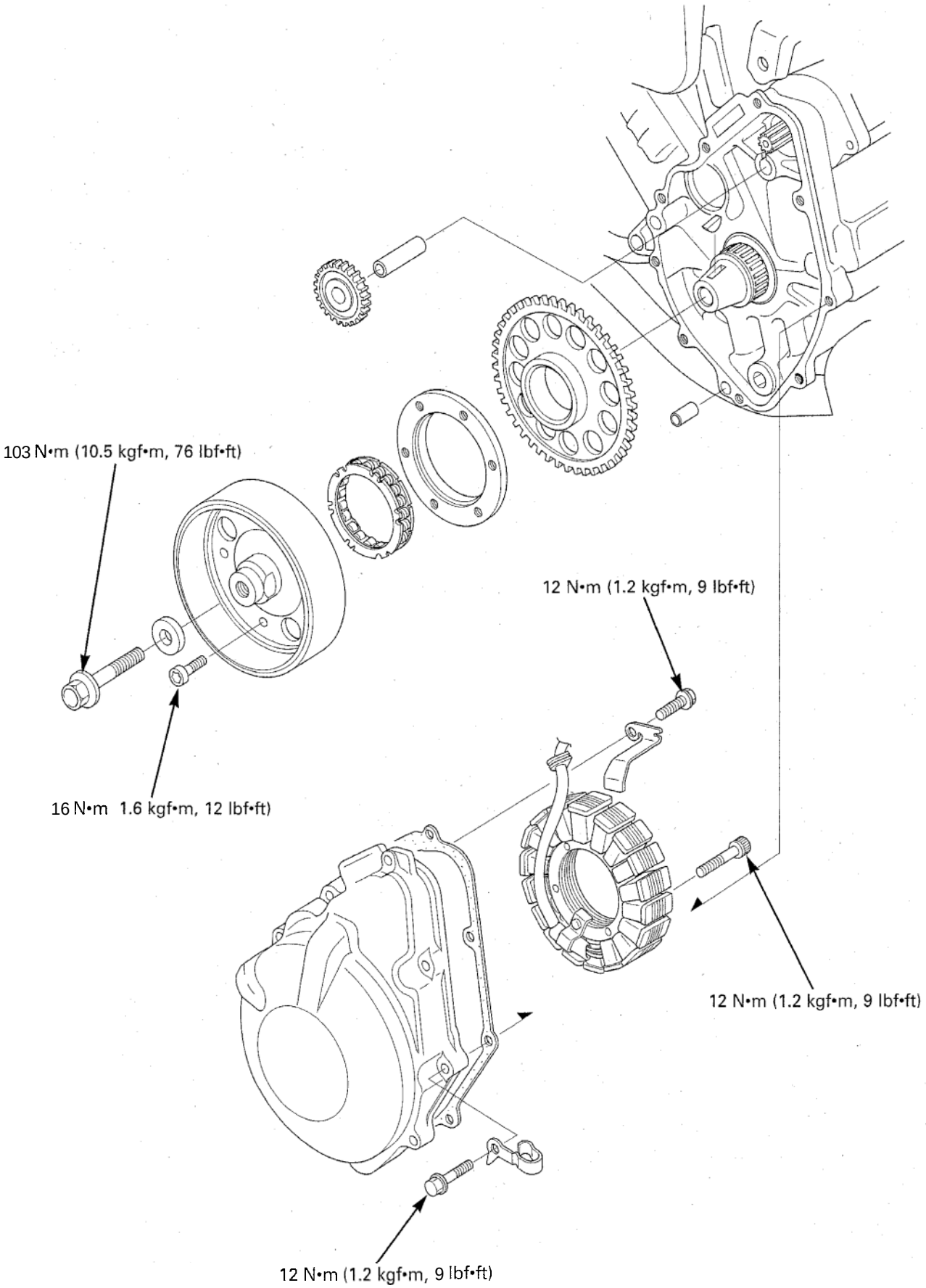


Install the right crankcase cover bolts.
Tighten the bolts crisscross pattern in two to three steps securely.



Connect the clutch cable end to the clutch lifter lever, then install the clutch cable bracket with the two bolts. Tighten the bolts securely.




103 N•m (10.5 kgf•m, 76 lbf•ft)
16 N•m 1.6 kgf•m, 12 lbf•ft)
12 N•m (1.2 kgf•m, 9 lbf•ft)
12 N•m (1.2 kgf•m, 9 lbf•ft)
12 N•m (1.2 kgf•m, 9 lbf•ft)

10. ALTERNATOR/STARTER CLUTCH

SERVICE INFORMATION	10-1	FLYWHEEL REMOVAL	10-3
TROUBLESHOOTING	10-1	STARTERCLUTCH	10-5
ALTERNATOR COVER REMOVAL	10-2	FLYWHEEL INSTALLATION	10-7
STATOR	10-2	ALTERNATOR COVER INSTALLATION	10-8

SERVICE INFORMATION

GENERAL

- This section covers service of the alternator, flywheel and starter clutch. II service can be done with the engine insta led in the frame.
- Refer *to* section 16 for alternator stator inspection.

SPECIFICATIONS

Unit: m m (in)

ITEM	STANDARD	SERVICE LIMIT
Starter driven gear boss O.D.	51.699 – 51.718 (2.0354–2.0361)	51.684 (2.0348)

10

TORQUE VALUES

Alternator wire clamp bolt	12 N•m (1.2 kgf•m, 9 lbf•ft)	CT bolt
Flywheel flange bolt	103 N•m (10.5 kgf•m, 76 lbf•ft)	Apply oil *to* the threads.
Stator mounting socket bolt	12 N•m (1.2 kgf•m, 9 lbf•ft)	
Starter one-way clutch torx bolt	16 N•m (1.6 kgf•m, 12 lbf•ft)	Apply a locking agent to the threads.
Alternator cover mounting bolt	12 N•m (1.2 kgf•m, 9 lbf•ft)	

TOOLS

Flywheel holder	07725-0040000	or equivalent commercially available in U.S.A.
Rotor puller	07733-0020001	or 07933–3950000 (U.S.A. only)

TROUBLESHOOTING

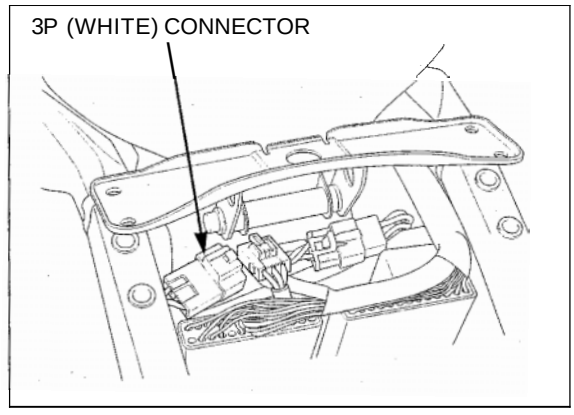
Engine does not turn
- Faulty starter clutch
- Damaged idle gear/shaft

ALTERNATOR COVER REMOVAL

Remove the ECM cover (page 5-87).
Remove the lower cowl (page 2-7).

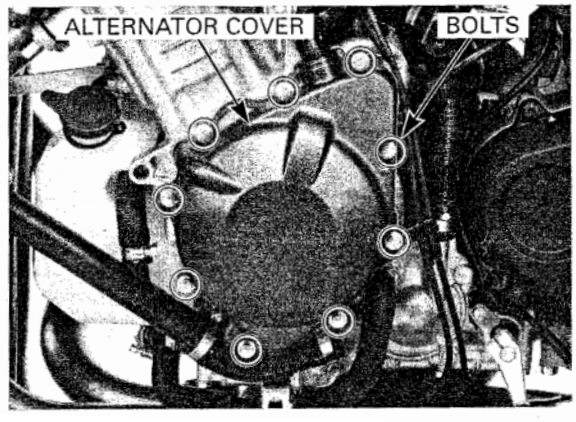
The alternator cover (stator) is magnetically attached to the flywheel, be careful during removal

Disconnect the alternator 3P (White) connector.

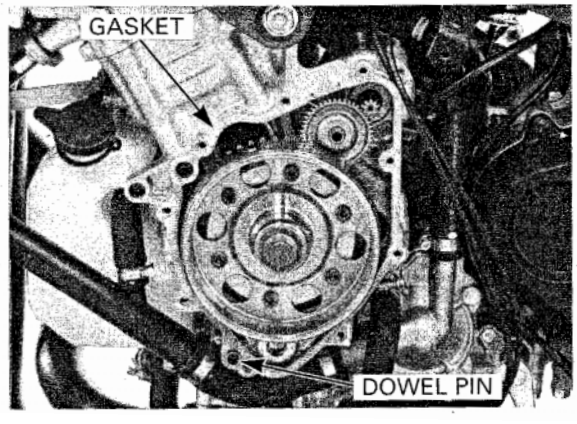


Remove the alternator cover SH bolts and alternator cover.

The engine oil will run out when the alternator cover is removed. Set a clean oil pan under the engine and add the recommended oil to the specified level after installation.



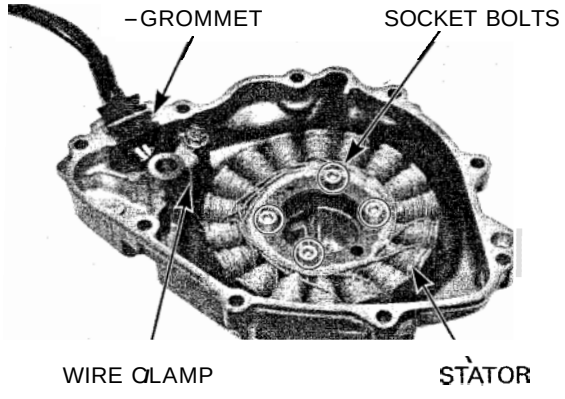
Remove the gasket and dowel pin.



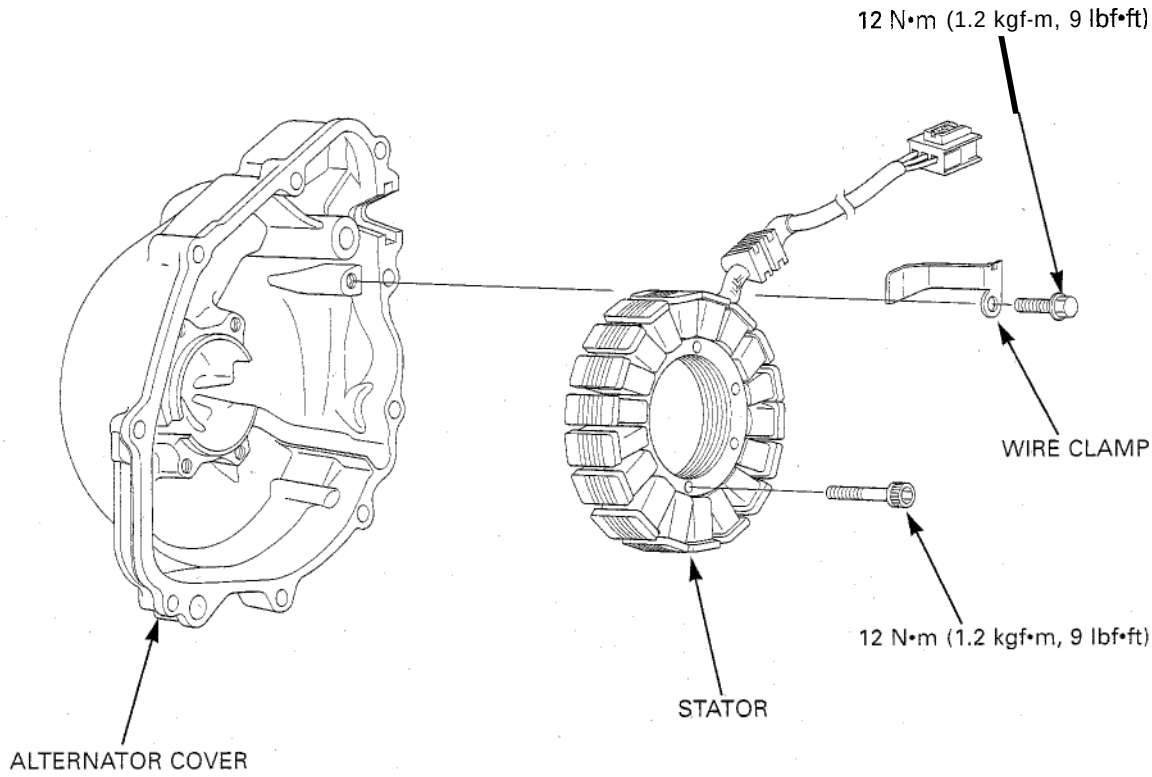
STATOR

REMOVAL

Remove the alternator wire grommet from the alternator cover.
Remove the bolt and stator wire clamp.
Remove the socket bolts and stator.



INSTALLATION



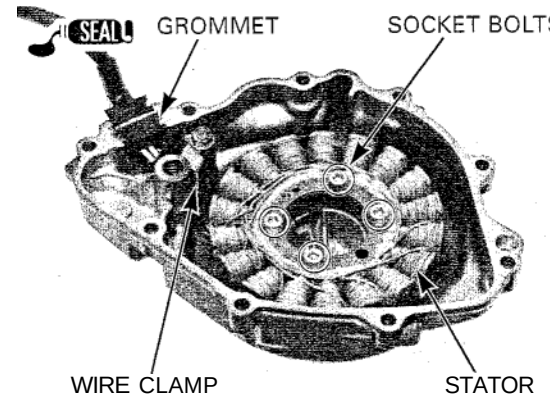
Install the stator into the alternator cover.

Apply sealant to the wire grommet, then install the wire grommet into the alternator groove securely. Install and tighten the stator mounting socket bolts to the specified torque.

TORQUE: 12 N•m (1.2 kgf-m, 9 lbf•ft)

Install the wire clamp and tighten the bolt to the specified torque.

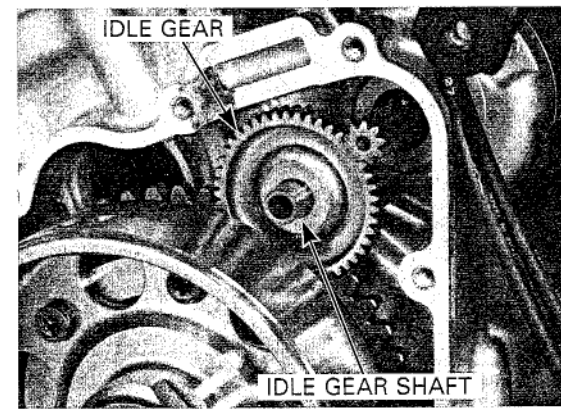
TORQUE: 12 N•m (1.2 kgf-m, 9 lbf•ft)



FLYWHEEL REMOVAL

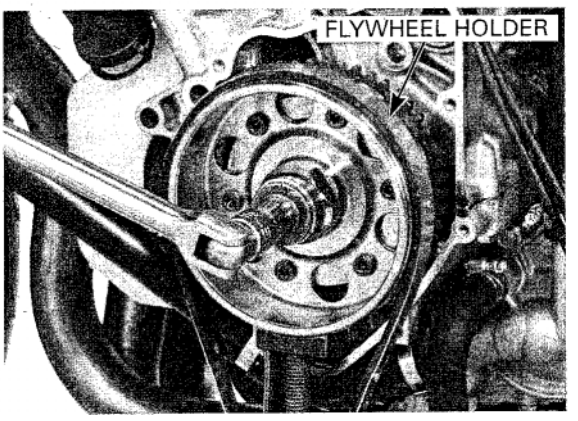
Remove the alternator cover (page 10-2).

Remove the starter idle gear shaft and idle gear.



Hold the flywheel using the flywheel holder, then remove the flywheel bolt.

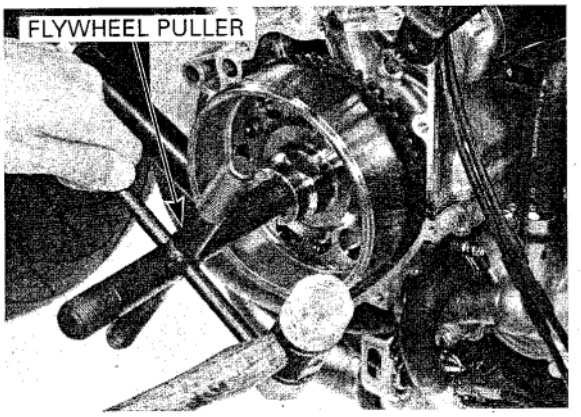
TOOL:
Flywheel holder **07725-0040000 (Equivalent commercially available in U.S.A.)**



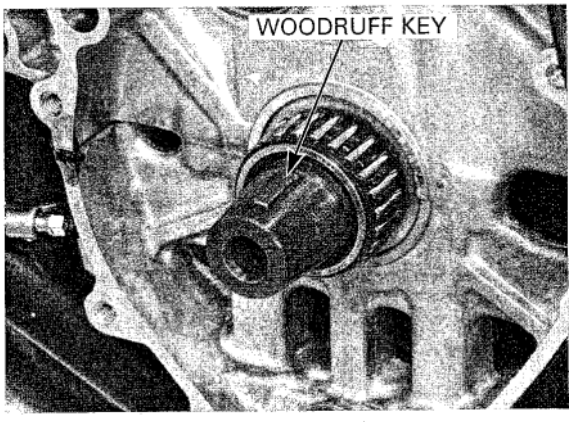
Remove the washer.

Remove the flywheel using the special tool.

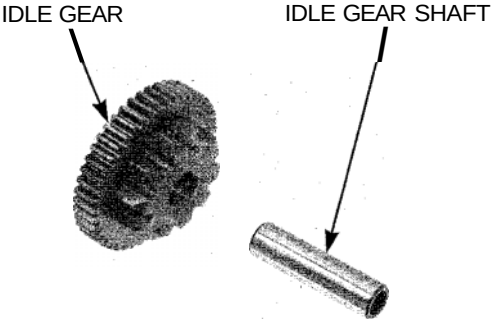
TOOL:
Rotor puller **07733-0020001 or 07933–3950000 (U.S.A. only)**



Remove the woodruff key.



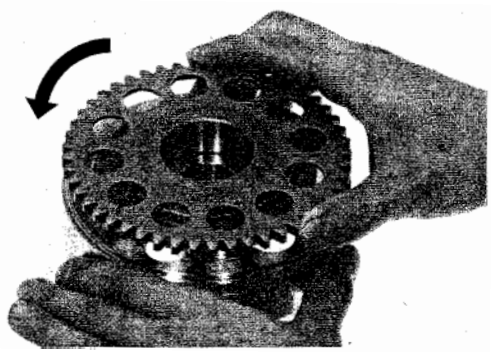
Check the starter idle gear and shaft for wear or damage.



STARTERCLUTCH

INSPECTION

Check the operation of the one-way clutch by turning the driven gear.
You should be able to turn the driven gear counter-clockwise smoothly, but the gear should not turn clockwise.



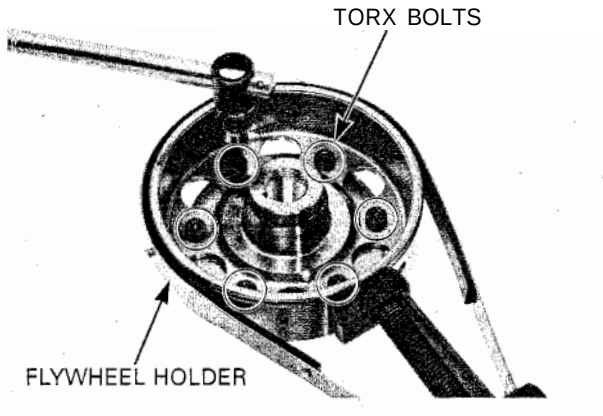
DISASSEMBLY

Remove the starter driven gear by turning it counter-clockwise.

Hold the flywheel with a flywheel holder, and remove the starter clutch mounting torx bolts.

TOOL:

Flywheel holder	**07725-0040000 (Equivalent commercially available in U.S.A.)**

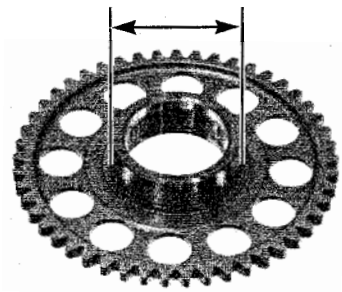


Remove the starter one-way clutch assembly.

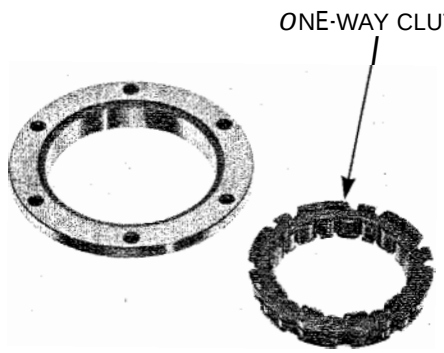
Check the starter driven gear for abnormal wear or damage.

Measure the starter driven gear boss O.D.

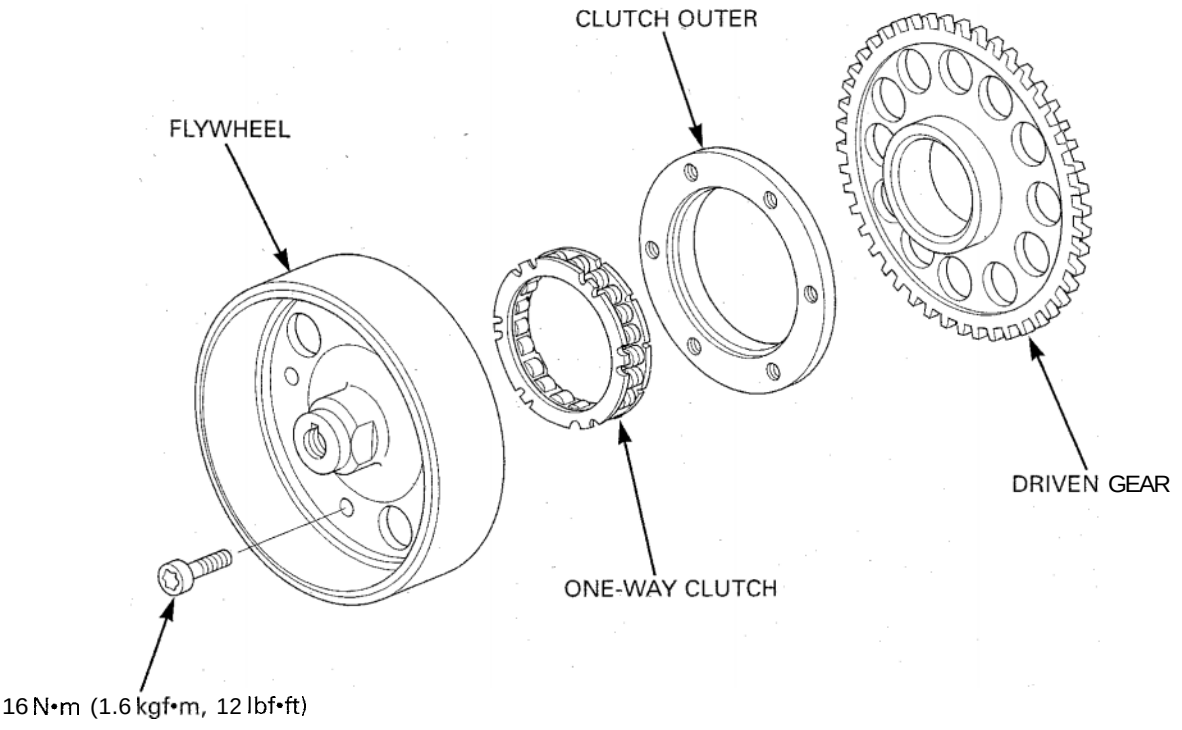
SERVICE LIMIT: 51.684 mm (2.0348 in)



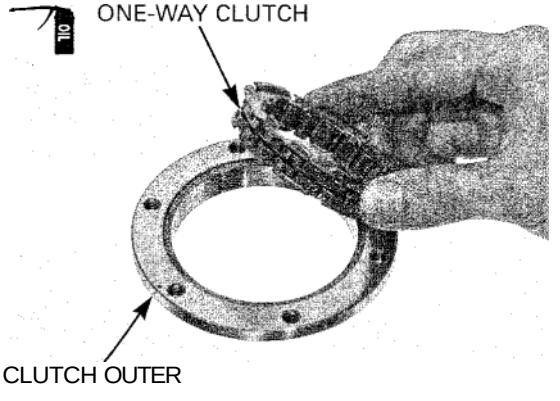
Check the one-way clutch for wear or damage and replace if necessary.



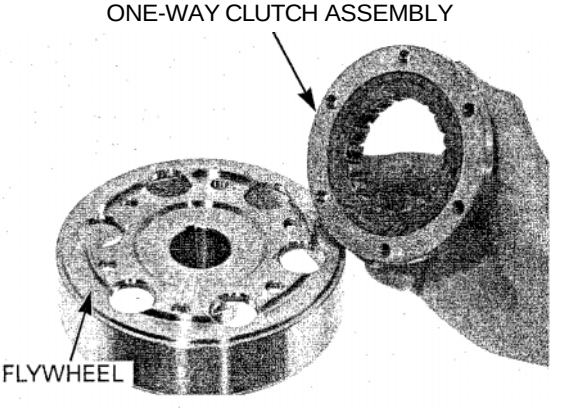
ASSEMBLY



Apply oil to the starter one-way clutch.
Install the one-way clutch into the clutch outer with the flange side facing out.



Install the starter one-way clutch assembly onto the flywheel.

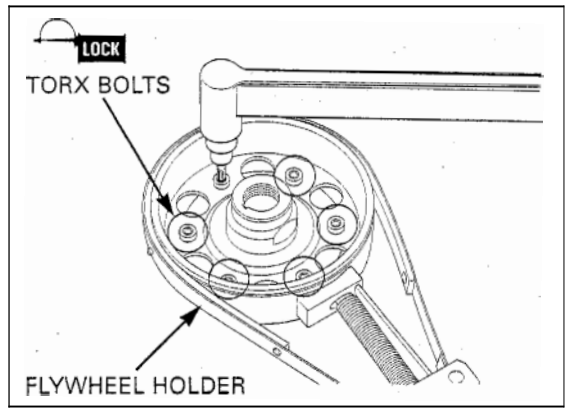


Apply a locking agent to the starter clutch outer mounting bolt threads.
Hold the flywheel with a flywheel holder, and tighten the starter clutch mounting torx bolts.

TOOL:

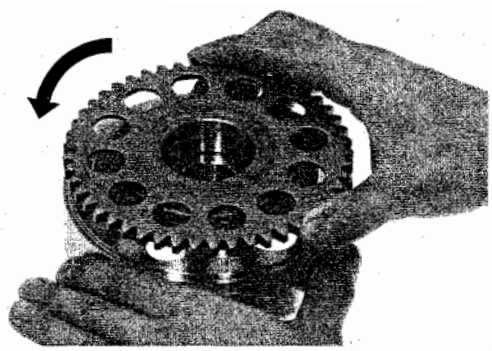
Flywheel holder	**07725-0040000 (Equivalent commercially available in U.S.A.)**

TORQUE: 16 N•m (1.6 kgf•m, 12 lbf•ft)



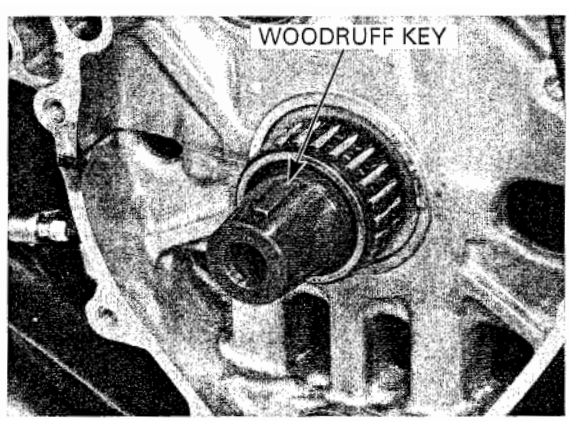
Install the starter driven gear into the one-way clutch.

Recheck the one-way clutch operation (page 10-5).



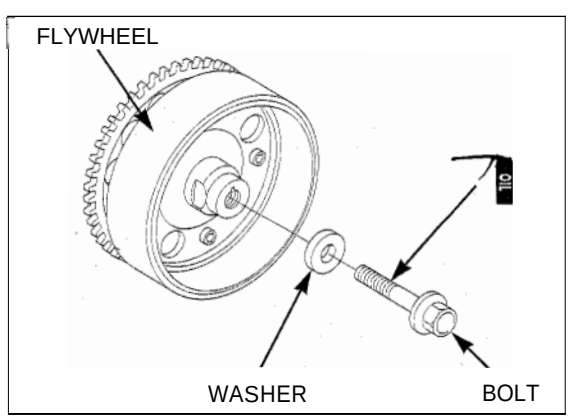
FLYWHEEL INSTALLATION

Clean any oil from the crankshaft taper.
Install the woodruff key on the crankshaft.



Install the flywheel aligning the key way in the flywheel with the woodruff key on the crankshaft.

Apply oil to the flywheel bolt threads and seating surface.
Install the washer and flywheel bolt.

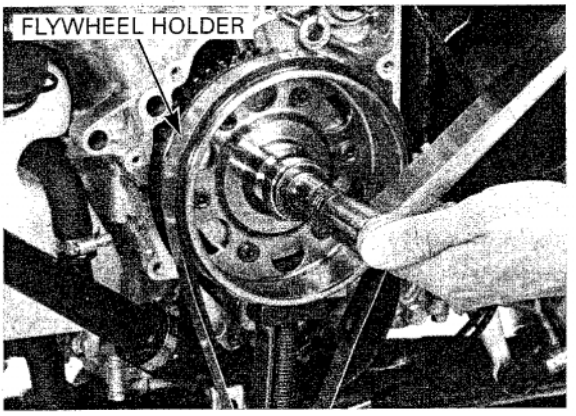


Hold the flywheel using the flywheel holder, then tighten the bolt to the specified torque.

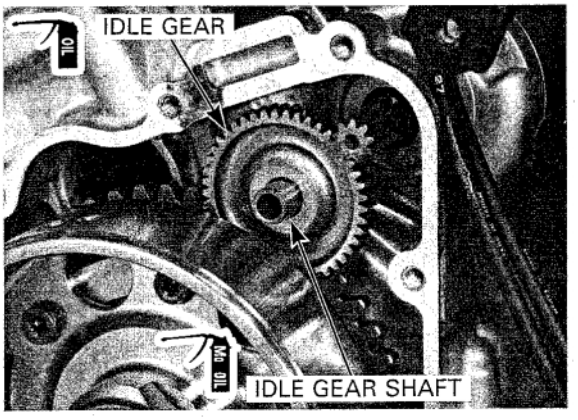
TOOL:

Flywheel holder	**07725-0040000 (Equivalent commercially available in U.S.A.)**

TORQUE: 103 N•m (10.5 kgf•m, 76 lbf•ft)

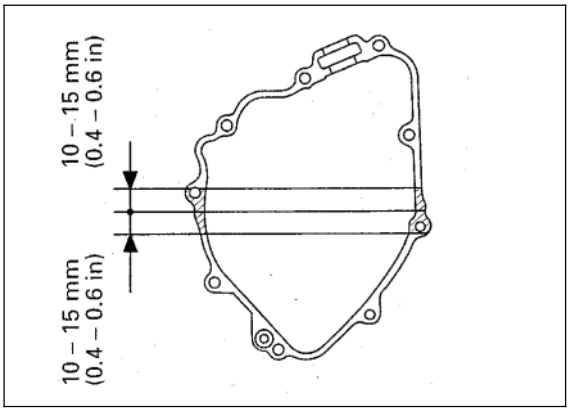


Apply molybdenum disulfide oil to the starter idle gear shaft.
Apply oil to the starter idle gear.
Install the starter idle gear and shaft onto the crankcase.

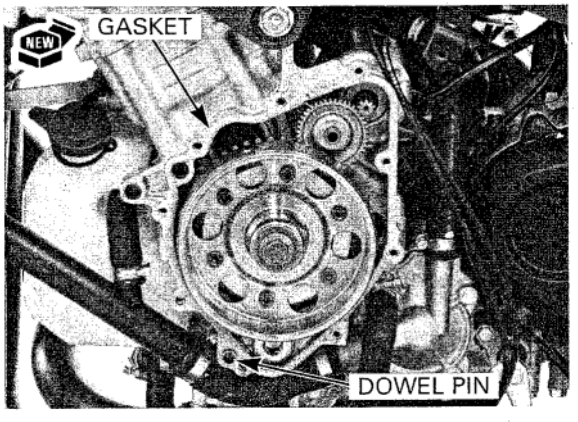


ALTERNATOR COVER INSTALLATION

Apply sealant to the mating surface of the crankcase as shown.



Install the dowel pin and new gasket.

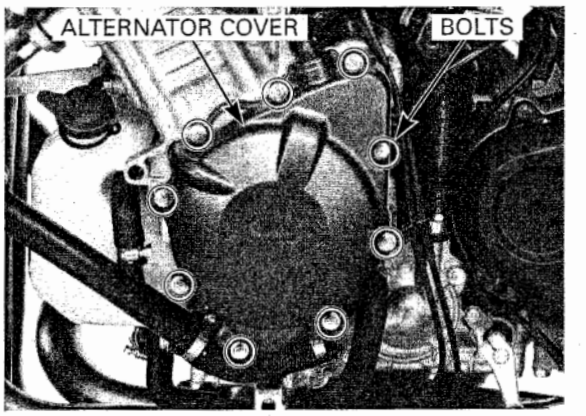


The aiternator cover (stator) is magnetically attached to the flywheel, be careful during installation

Install the alternator cover.

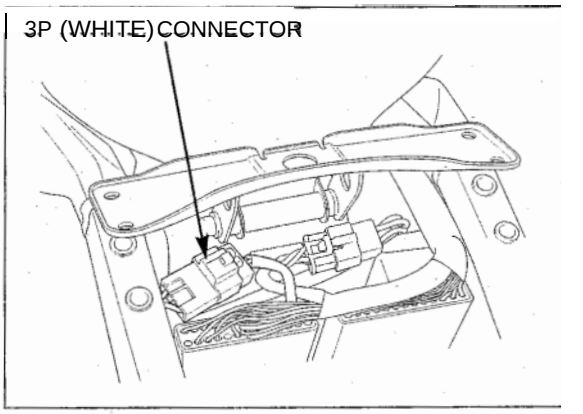
Install and tighten the SH bolts to the specified torque.

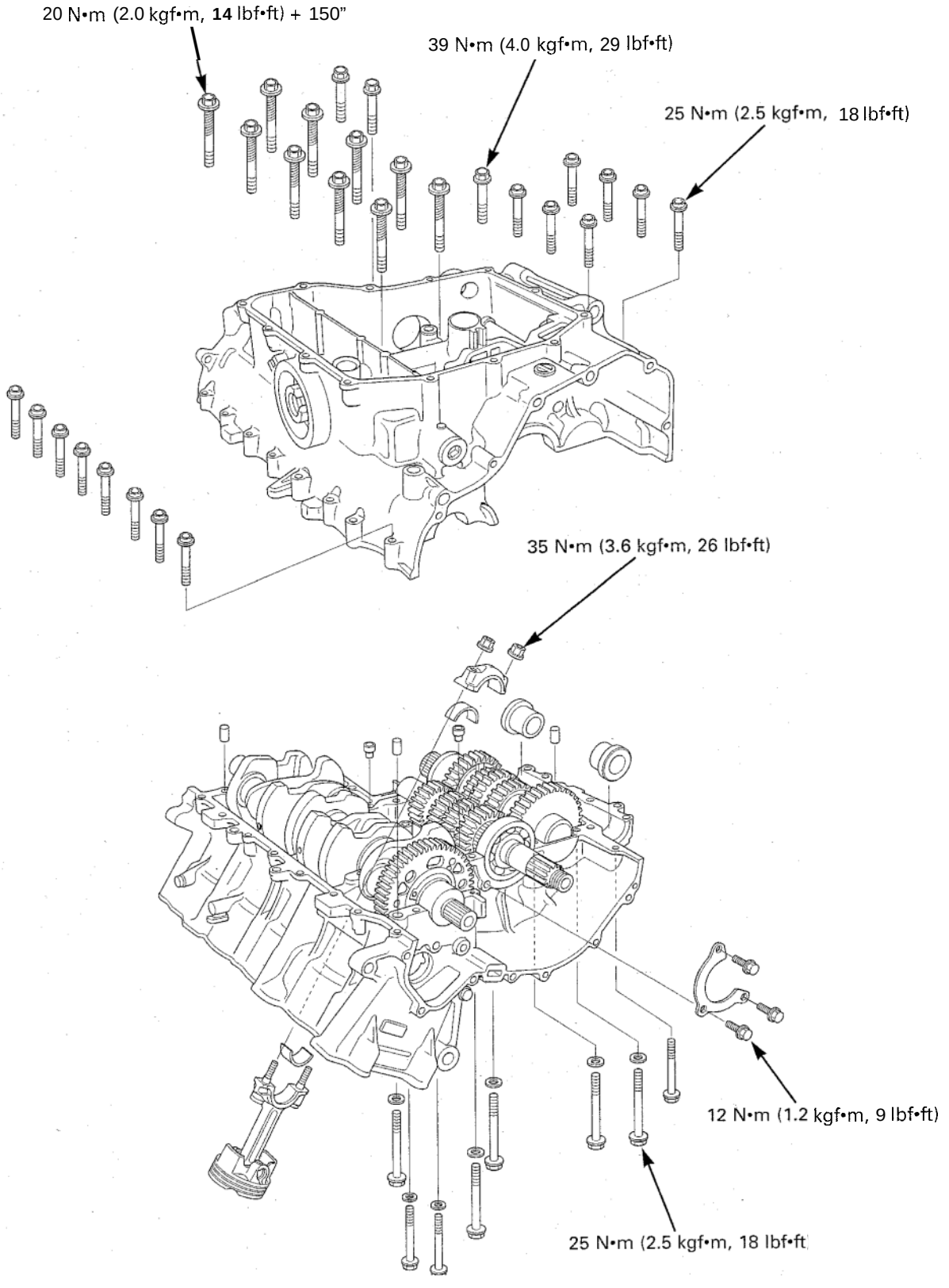
TORQUE: 12 N·m (1.2 kgf·m, 9 lbf·ft)



Connect the alternator 3P (White) connector.

install the lower cowl (page 2-7).
Install the ECM cover (page 5-87).




20 N•m (2.0 kgf•m, 14 lbf•ft) + 150°
39 N•m (4.0 kgf•m, 29 lbf•ft)
25 N•m (2.5 kgf•m, 18 lbf•ft)
35 N•m (3.6 kgf•m, 26 lbf•ft)
12 N•m (1.2 kgf•m, 9 lbf•ft)
25 N•m (2.5 kgf•m, 18 lbf•ft)

11. CRANKCASE/PISTON/CYLINDER

SERVICE INFORMATION	11-1	PISTON/CONNECTING ROD	11-4
TROUBLESHOOTING	11-2	CRANKCASE COMBINATION	11-12
CRANKCASE SEPARATION	11-3		

SERVICE INFORMATION

GENERAL

NOTICE

- *The main journal 9-mm bolts tightening method uses the Plastic Region Tightening Method (page 11-12).*
- *Always use a new main journal 9-mm bolts (page 11-12).*
- *The main journal 9-mm bolts is pre-coated with an oil additive for axial tension stability. Do not remove the oil additive from the new 9-mm bolt surfaces.*
- *Be sure to follow the tightening procedure on page 11-12 for crankcase bolt tightening.*

- This section covers crankcase separation for service of the crankshaft and pistons.
- The following parts must be removed before separating the crankcase.
  - Alternator/flywheel (Section 10)
  - Clutch/gearshift linkage (Section 9)
  - Cylinder head (Section 8)
  - Engine (Section 7)
  - Oil pump (Section 4)
- Mark and store the disassemble parts to ensure that they are installed in their original locations.
- Mark and store the bearing inserts to be sure of their correct locations for reassembly. If the inserts are improperly installed, they will block the oil hole, causing insufficient lubrication and eventual engine seizure.
- The connecting rod bearing inserts are select fit and are identified by color codes. Select replacement bearings from the code tables. After installing new bearings, recheck them with plastigauge to verify clearance. Apply molybdenum disulfide oil to the crank pin during assembly.

SPECIFICATIONS

Unit: mm (in)

ITEM			STANDARD	SERVICE LIMIT
Cylinder	I.D.		75.000 – 75.015 (2.9528 – 2.9533)	75.15 (2.959)
	Out-of-round		—	0.10 (0.004)
	Taper		—	0.10 (0.004)
	Warpage		—	0.05 (0.002)
Piston, piston rings	Piston mark direction		"O" mark facing toward the intake side	—
	Piston O.D.		74.960 – 74.980 (2.9512 – 2.9520)	74.895 (2.949)
	Piston O.D. measurement point		4 mm (0.2 in) from bottom of skirt	—
	Piston pin bore I.D.		17.002 – 17.008 (0.6694 – 0.6696)	17.03 (0.670)
	Piston pin O.D.		16.994 – 17.000 (0.6691 – 0.6693)	16.98 (0.669)
	Piston-to-piston pin clearance		0.002 – 0.014 (0.0001 – 0.0006)	—
	Piston ring-to-ring groove clearance	Top	0.030 – 0.065 (0.0012 – 0.0026)	0.08 (0.003)
		Second	0.015 – 0.045 (0.0006 – 0.0018)	0.06 (0.002)
	Piston ring end gap	Top	0.28 – 0.38 (0.011 – 0.015)	0.5 (0.02)
		Second	0.40 – 0.55 (0.016 – 0.022)	0.7 (0.03)
		Oil (side rail)	0.2 – 0.7 (0.01 – 0.03)	0.9 (0.04)
Cylinder-to-piston clearance			0.020 – 0.055 (0.0008 – 0.0022)	—
Connecting rod small end I.D.				
Connecting rod-to-piston pin clearance			0.016 – 0.040 (0.0006 – 0.0016)	—
Connecting rod side clearance			0.05 – 0.20 (0.002 – 0.008)	0.30 (0.012)
Crankpin oil clearance			0.030 – 0.052 (0.0012 – 0.0020)	0.062 (0.0024)

TORQUE VALUES

Mainshaft bearing set plate bolt	12 N•m (1.2 kgf•m, 9 lbf•ft)	Apply a locking agent to the threads.
Crankcase bolt, 10 mm	39 N•m (4.0 kgf•m, 29 lbf•ft)	
9 mm (main journal bolt)	20 N•m (2.0 kgf•m, 14 lbf•ft) + 150°	See page 11-12.
8 mm	25 N•m (2.5 kgf•m, 18 lbf•ft)	
Connecting rod bearing cap nut	35 N•m (3.6 kgf•m, 26 lbf•ft)	Apply oil to the threads.
Upper crankcase sealing bolt	22 N•m (2.2 kgf•m, 16 lbf•ft)	Apply a locking agent to the threads.
Lower crankcase sealing bolt, 20 mm	30 N•m (3.1 kgf•m, 22 lbf•ft)	Apply a locking agent to the threads.
10 mm	12 N•m (1.2 kgf•m, 9 lbf•ft)	Apply a locking agent to the threads.

TROUBLESHOOTING

Cylinder compression is too low, or engine is hard to start
- Blown cylinder head gasket
- Worn, stuck or broken piston ring
- Worn or damaged cylinder or piston
- Bent valve, or bent and deteriorated valve seat

Cylinder compression is too high, or engine overheats or knocks
- Carbon deposits on the cylinder head and/or piston crown

Piston noise
- Worn cylinder, piston and/or piston ring
- Worn piston pin hole and piston pin
- Worn connecting rod small end

Excessive smoke
- Worn, stuck or broken piston ring
- Worn valve stem seal

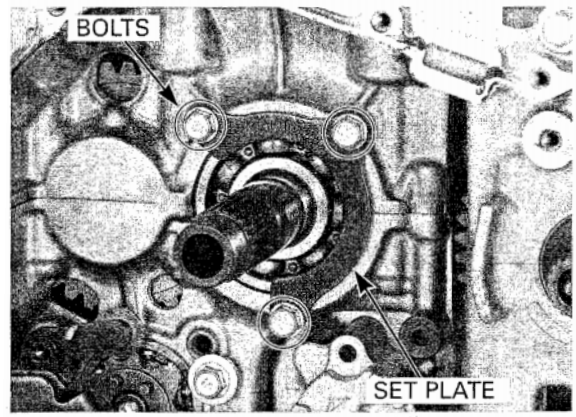
Excessive noise
- Worn connecting rod big end bearing
- Bent connecting rod
- Worn crankshaft main journal bearing
- Worn transmission bearing

Engine vibration
- Excessive crankshaft runout

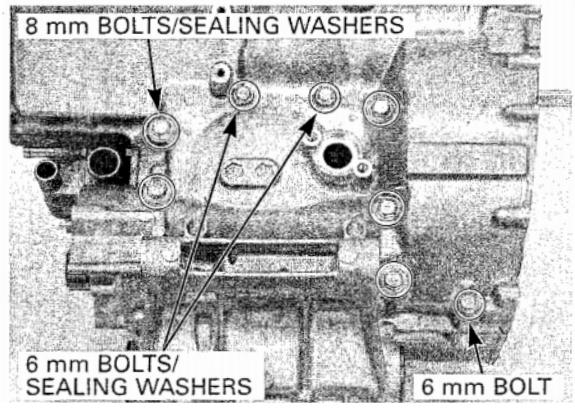
CRANKCASE SEPARATION

Refer to Service Information (page 11-1) for removal of necessary parts before separating the crankcase.

Remove the mainshaft bearing set plate bolts and plate.

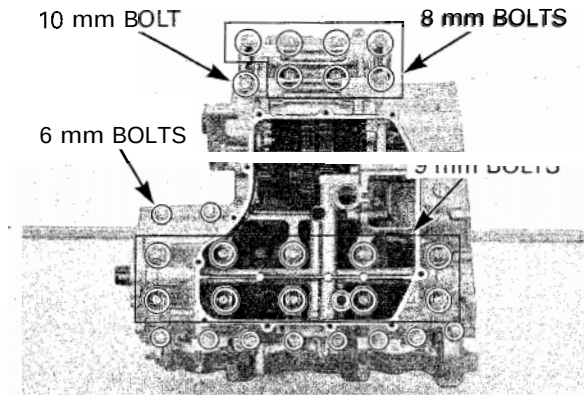


Remove the upper crankcase 8 mm bolts/sealing washers and 6 mm bolt.

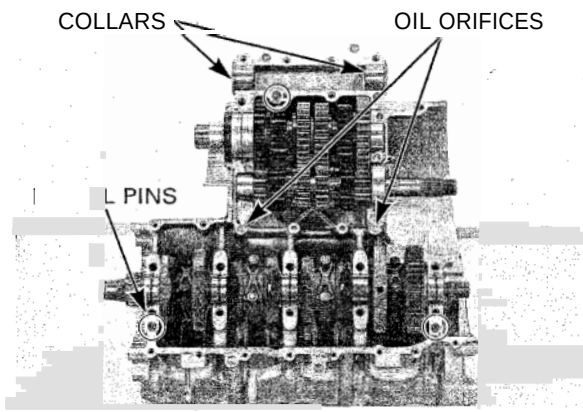


Remove the lower crankcase 6 mm bolts (ten), 8 mm bolts (seven) and 10 mm bolt.
Loosen the ten lower crankcase 9 mm bolts in a criss-cross pattern in two to three steps, then remove the bolts.

Separate the lower crankcase from the upper crankcase.



Remove the swingarm pivot collars, dowel pins and oil orifices.



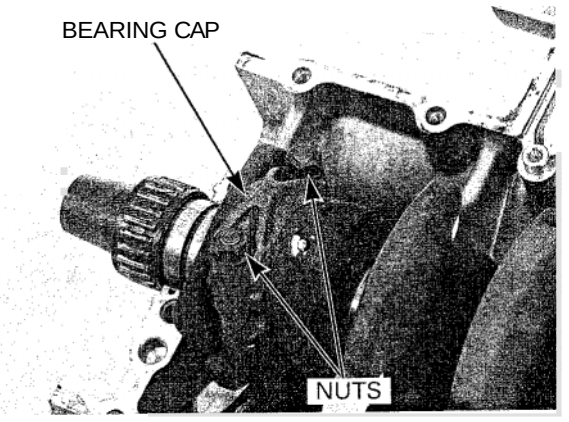
PISTON/CONNECTING ROD

PISTON/CONNECTING ROD REMOVAL

Mark all parts during removal so they can be replaced in their original locations

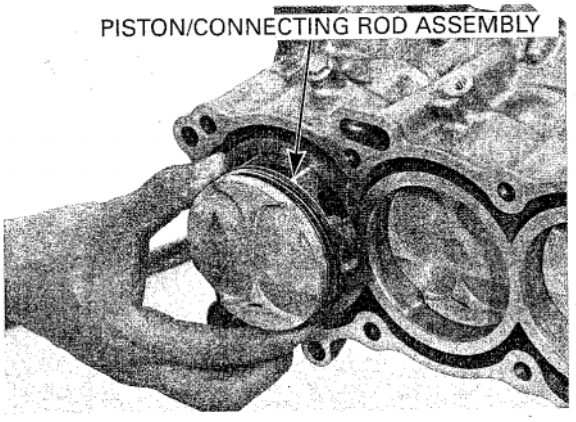
NOTICE

Do not interchange the bearing inserts. They must be installed in their original locations or the correct bearing oil clearance may not be obtained, resulting in engine damage.



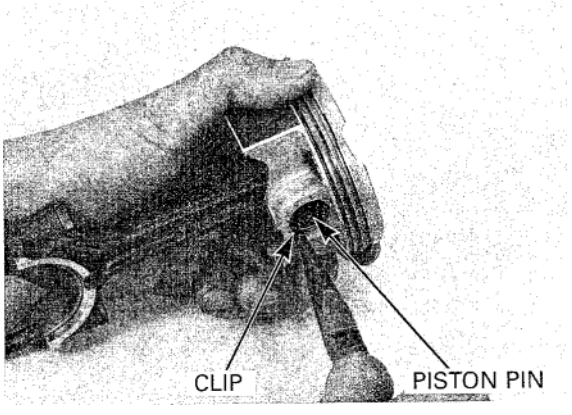
Remove the nuts and connecting rod bearing cap.

Remove the piston/connecting rod assembly from the top of the cylinder.



PISTON REMOVAL

Remove the piston pin clip with pliers.
Press the piston pin out of the piston and remove the piston from the connecting rod.

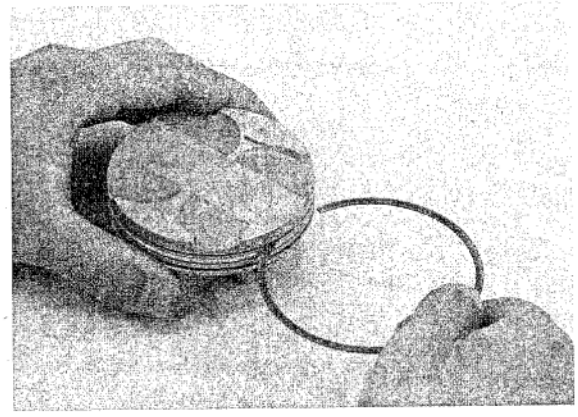


PISTON DISASSEMBLY

Do not damage the piston rings during removal.

Remove the piston rings.

Remove any carbon deposits from the piston ring grooves, using an old piston ring as shown.



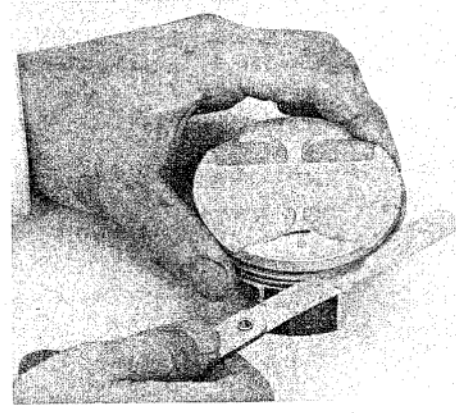
PISTON INSPECTION

Temporarily install the piston rings to their proper position with the mark facing up.

Measure the piston ring-to-ring groove clearance with the rings pushed into the grooves.

SERVICE LIMITS:
Top: 0.08 mm (0.003 in)
Second: 0.06 mm (0.002 in)

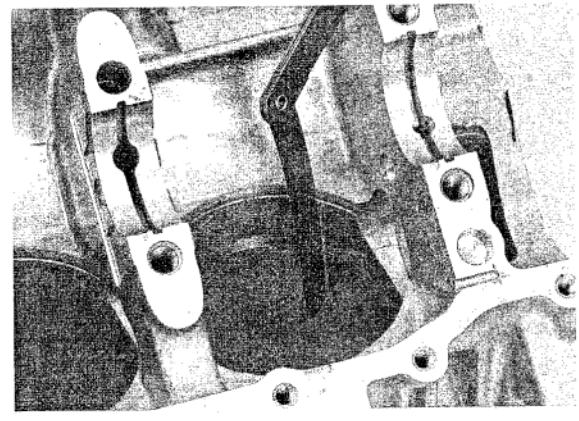
Inspect the piston for wear or damage.



Push the rings into the cylinder with the top of the piston to be sure they are squarely in the cylinder.

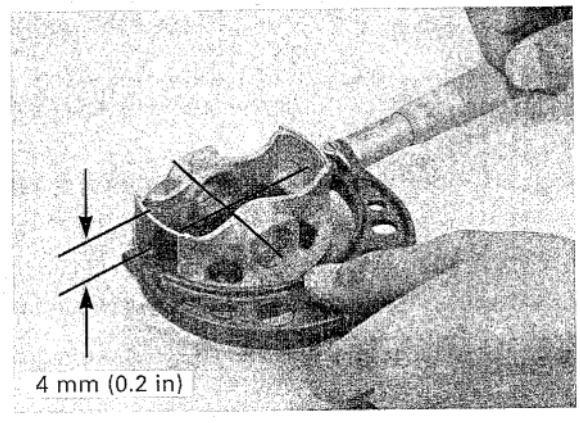
Insert the piston ring squarely into the bottom of the cylinder and measure the ring end gap.

SERVICE LIMITS:
Top: 0.5 mm (0.02 in)
Second: 0.7 mm (0.03 in)
Oil (side rail): 0.9 mm (0.04 in)



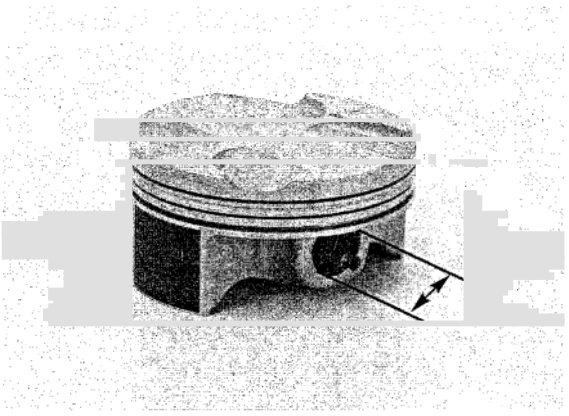
Measure the diameter of the piston at 4 mm (0.2 in) from the bottom and 90 degrees to the piston pin hole.

SERVICE LIMIT: 74.895 mm (2.949 in)



Measure the piston pin bore.

SERVICE LIMIT: 17.03 mm (0.670 in)

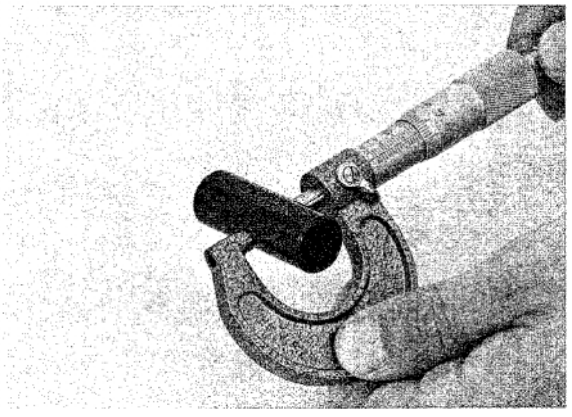


Measure the O.D. of the piston pin.

SERVICE LIMIT: 16.98 mm (0.669 in)

Calculate the piston-to-piston pin clearance.

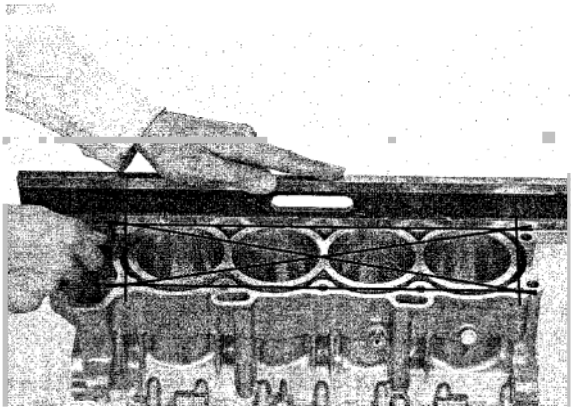
STANDARD: 0.002 **– 0.014 mm (0.0001 – 0.0006 in)**



CYLINDER INSPECTION

Inspect the top of the cylinder for warpage.

SERVICE LIMIT: 0.05 mm (0.002 in)

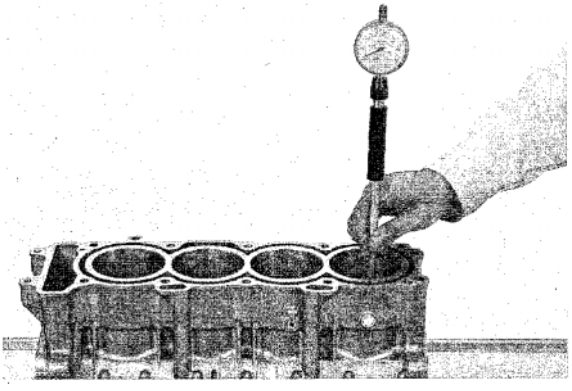


Inspect the cylinder bore for wear or damage.
Measure the cylinder I.D. in X and *Y* axis at three levels.
Take the maximum reading to determine the cylinder wear.

SERVICE LIMIT: 75.15 mm (2.959 in)

Calculate the piston-to-cylinder clearance.
Take a maximum reading to determine the clearance.
Refer to page 11-5 for measurement of the piston O.D.

STANDARD: 0.020 – 0.055 mm (0.0008 – 0.0022 in)

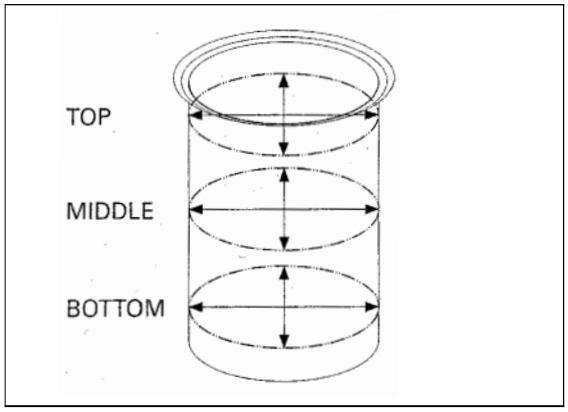


Calculate the taper and out-of-round at three levels in the X and Y axes, Take the maximum reading to determine them.

SERVICE LIMITS:
Taper: 0.10 rnm (0.004 in)
Out-of-round: 0.10 rnm (0.004 in)

The cylinder must be rebored and an oversize piston fitted if the service limits are exceeded.

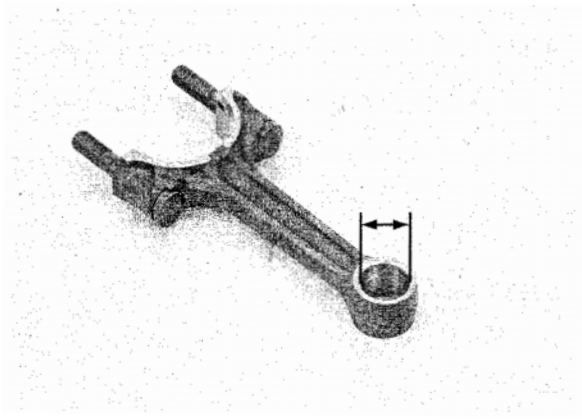
The piston to cylinder clearance for the oversize piston must be: 0.015 – 0.050 mm (0.0006 – 0.0020 in).



CONNECTING ROD INSPECTION

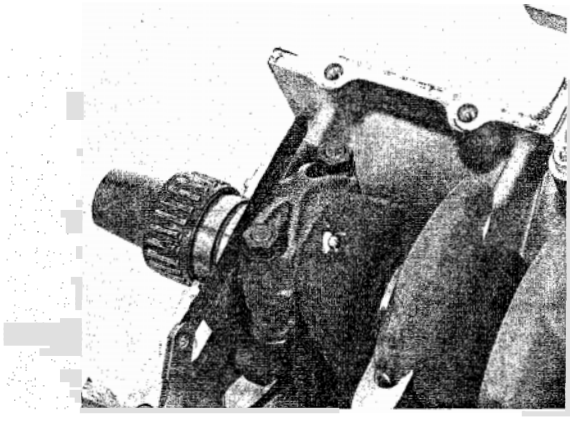
Measure the connecting rod small end I.D.

SERVICE LIMIT: 17.04 rnrn (0.671 in)



Temporarily install the connecting rod to the crankshaft.
Install the bearing inserts and bearing cap, and tighten the nuts.
Measure the connecting rod side clearance.

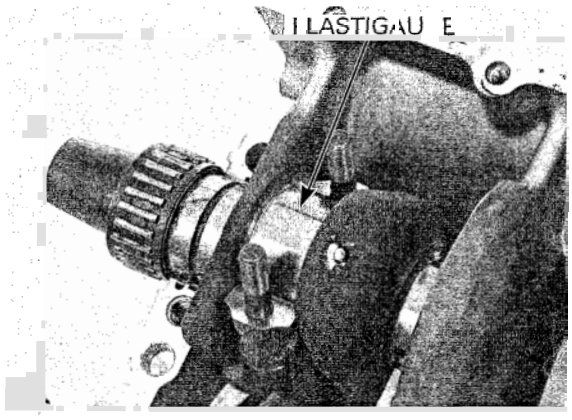
SERVICE LIMIT: 0.30 mrn (0.012 in)



CRANKPIN BEARING INSPECTION

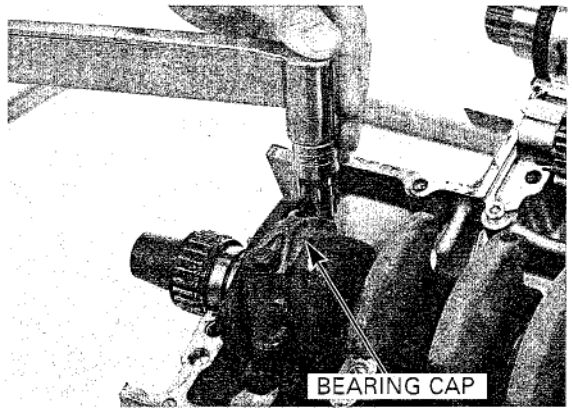
Wipe all oil from the bearing inserts and crankpins.
Put a piece of plastigauge on each crankpin.

- Do not put the plastigauge over the oil hole in the crankpin.
- Do not rotate the crankshaft during inspection.



Install the bearing caps and connecting rods on a correct crankpins, and tighten the cap nuts to the specified torque.

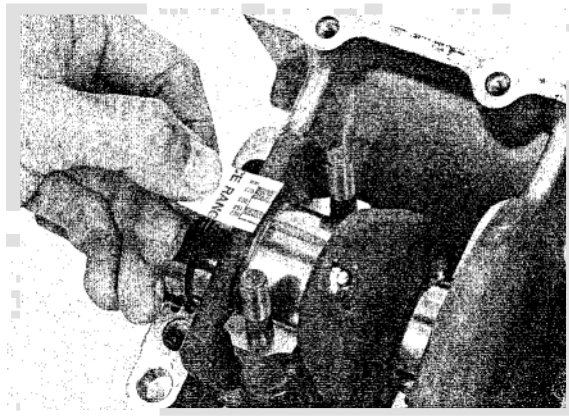
TORQUE: 35 N•m (3.6 kgf•m, 26 lbf•ft)



Remove the connecting rod caps and measure the compressed plastigauge on each crankpin.

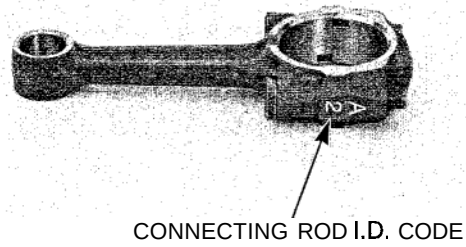
SERVICE LIMIT: 0.062 mm (0.0024 in)

If the connecting rod bearing clearance is beyond tolerance, selects replacement bearing.



CRANKPIN BEARING SELECTION

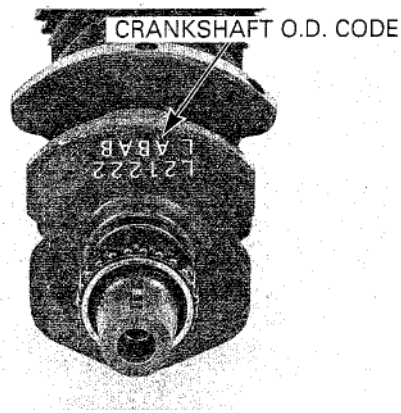
Record the connecting rod I.D. code number (1, 2 or 3) or measure the I.D. with the bearing cap installed without bearing inserts.



Letters (A, B or C) on the crank weight are the codes for the crankpin O.D.s starting from the left

If you are replacing the crankshaft, record the corresponding crankpin O.D. code letter (A, B or C).

If you are reusing the crankshaft, measure the crankpin O.D. with the micrometer.



Cross-reference the crankpin and rod codes to determine the replacement bearing color.

BEARING THICKNESS:

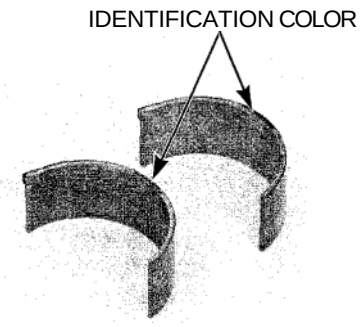
A (Blue): Thick

B (Black):

C [Brown):

D (Green)

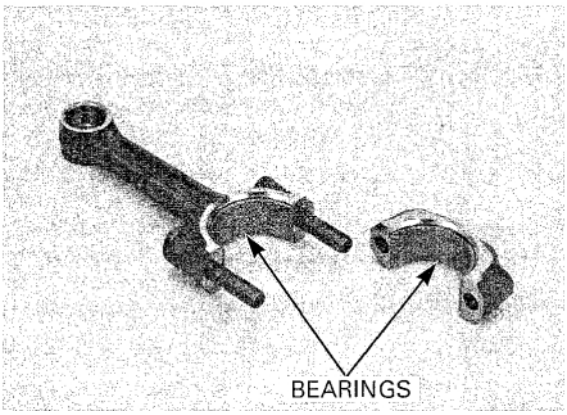
E (Yellow) Thin



			CONNECTING ROD I.D. CODE		
			1	2	3
			39.000 – 39.006 (1.5354 – 1.5357)	39.006 – 39.012 (1.5357 – 1.5359)	39.012 – 39.018 (1.5359 – 1.5361)
CRANK PIN O.D. CORD	A	35.997 – 36.003 (1.4172 – 1.4174)	E (Yellow)	D (Green)	C (Brown)
	B	35.991 – 35.997 (1.4170 – 1.4172)	D (Green)	C (Brown)	B (Black)
	C	35.985 – 35.991 (1.4167 – 1.4170)	C (Brown)	B (Black)	A (Blue)

Align the bearing fabs with the groove in the connecting rod and bearing cap

Install the bearing inserts into the connecting rod and bearing cap.



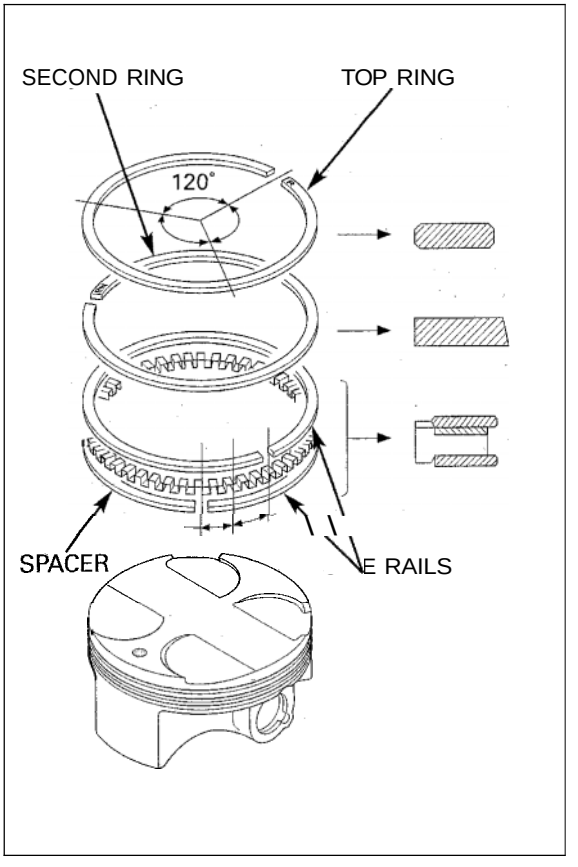
PISTON ASSEMBLY

Clean the piston ring grooves thoroughly and install the piston rings.

- Apply oil to the piston rings.
- Avoid piston and piston ring damage during installation.
- Install the piston rings with the marking (R:top ring, RN: second ring) facing up.
- Do not switch the top and second rings; the top ring is narrower than the second ring in width.

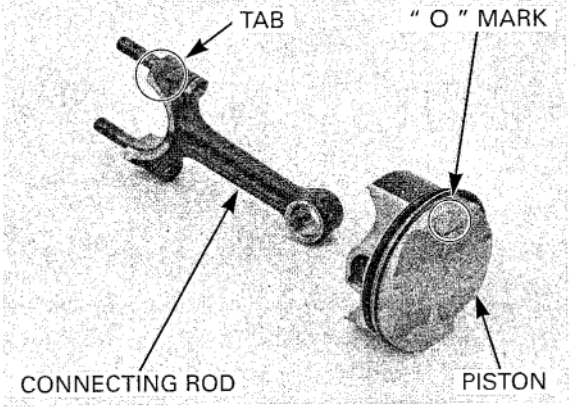
Space the piston ring end gaps 120 degrees apart.
Do not align the gaps in the oil rings (side rails).

After installation, the rings should rotate freely in the ring grooves.



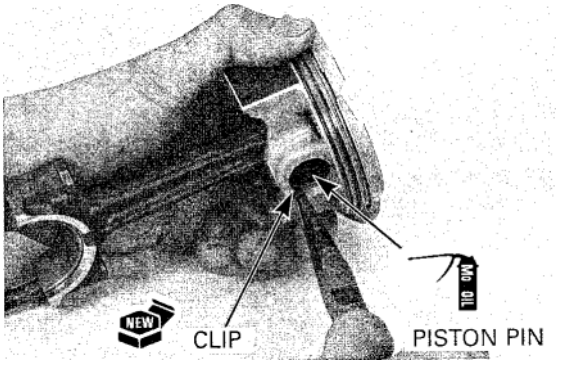
PISTON INSTALLATION

Assemble the piston and connecting rod with the journal bearing tab facing to the piston intake side ("O" mark).



Apply molybdenum disulfide oil to the piston pin outer surface.
Install the piston pin, and secure it using a new piston pin clips.

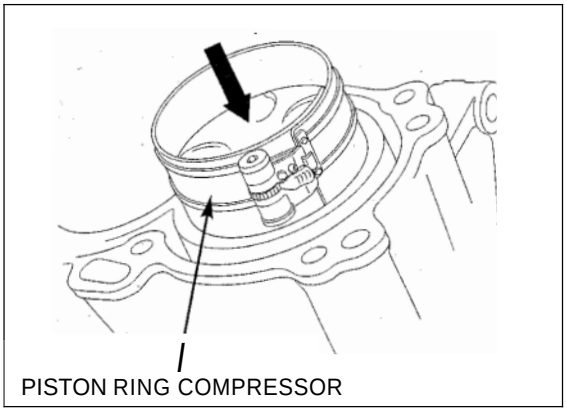
Do not align the piston pin clips end gap with the piston cut-out



Apply oil to the cylinder sleeves and piston rings.

Install the piston/connecting rod assembly with the piston "O" mark facing to the intake side.

Install the piston/connecting rod assembly into the cylinder using a commercially available piston ring compressor tool.
When reusing the connecting rods, they must be installed in their original locations.



NOTICE

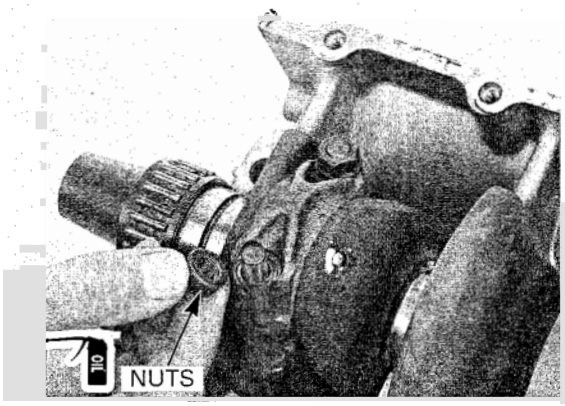
- *While installing the piston, being careful not to damage the top surface of the cylinder, especially around the cylinder bore.*
- *Be careful not to damage the cylinder sleeve and crankpin with the connecting rod bolt threads.*

Make sure the ring compressor tool sits flush with the top surface of the cylinder

Use the handle of a plastic hammer to tap the piston into the cylinder.

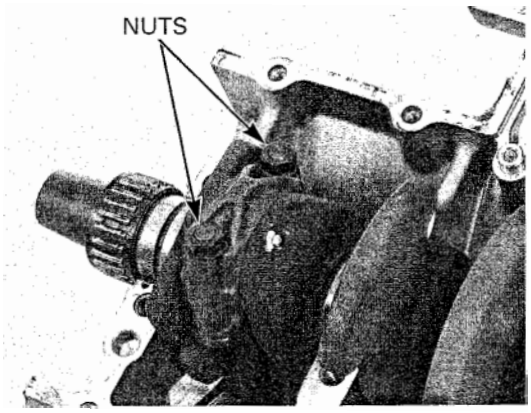
Apply molybdenum disulfide oil to the crankpin bearing surfaces.
Install the bearing cap.
Insure that the marks on the caps are aligned with the marks on the connecting rods.

Apply oil *to* the connecting rod nut threads and seating surfaces.



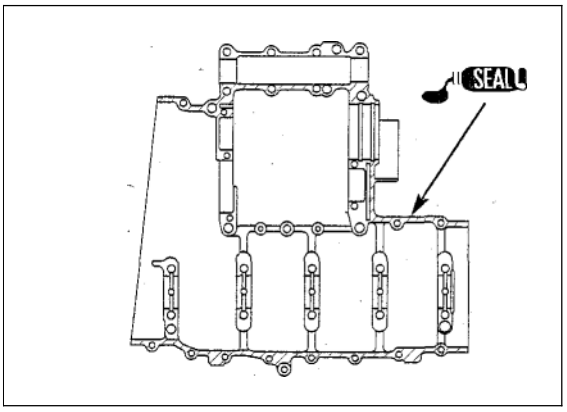
Install the connecting rod bearing cap nuts and tighten the nuts gradually and alternately, then tighten them to the specified torque.

TORQUE: 35 N•m (3.6 kgf•m, 26 lbf•ft)



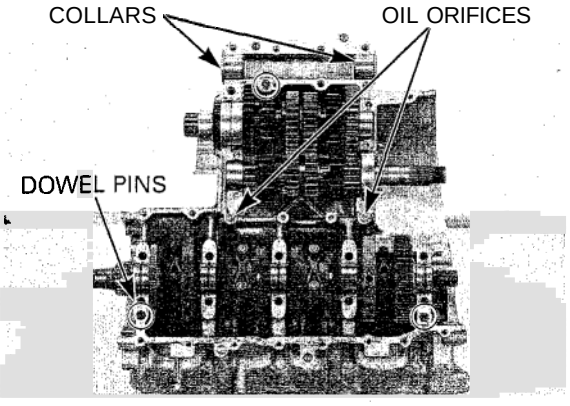
CRANKCASE COMBINATION

Apply a light, but thorough coating of liquid sealant to the crankcase mating surface except to the main bearing journal bolt (lower crankcase bolt, 9 mm) area and the oil passage area as shown.



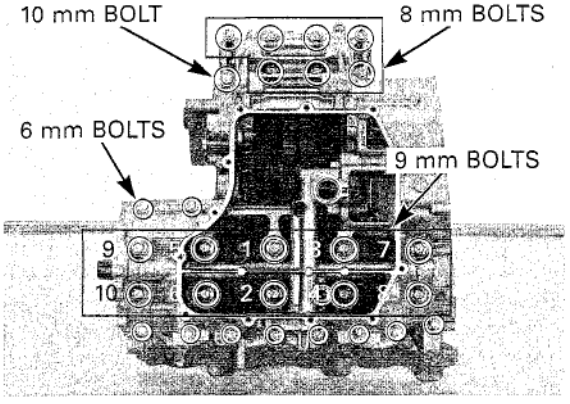
Install the three dowel pins.
Install oil orifices aligning their cut-out with the groove in the upper crankcase.

Install the swingarm pivot collars.



- Tighten the main journal 9 mm bolts using the Plastic Region tightening Method described below.
- Do not reuse the main journal 9 mm bolts, because the correct axial tension will not be obtained.
- The main journal 9 mm bolt is pre-coated with an oil additive for axial tension stability. Do not remove the oil additive from the new 9 mm bolt surface.

Install the lower crankcase onto the upper crankcase.



PLASTIC REGION TIGHTENING METHOD:
Install the new main journal 9 mm bolts.
Loosely install all the lower crankcase bolts.
Make sure the upper and lower crankcase are seated securely.
Make sure the swingarm pivot collar flanges are seated in the crankcase securely.

Tighten the main journal 9 mm bolts as follow:

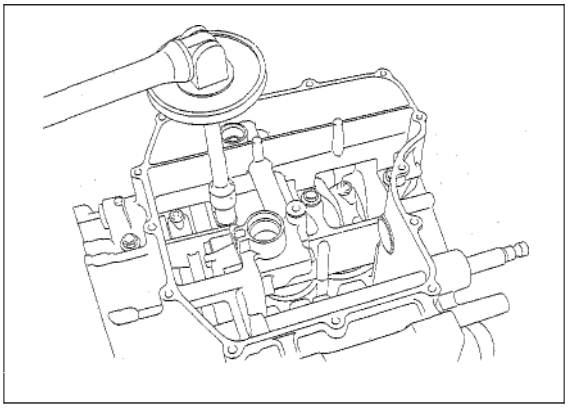
Tighten the 9 mm bolts in numerical order in the illustration to the following torque.

TORQUE: 10 N•m (1.0 kgf•m, 7 lbf•ft)

Retighten the 9 mm bolts in the same order above to the following torque..

TORQUE: 20 N•m (2.0 kgf•m, 14 lbf•ft)

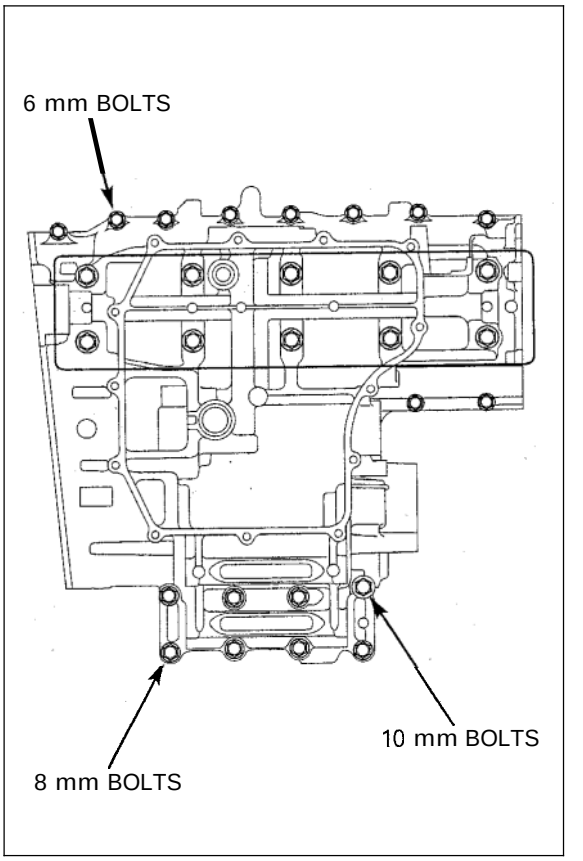
Further tighten the 9 mm bolts 150 degrees.



Tighten the 6 mm bolts securely.

Tighten the 10 mm bolt, and then 8 mm bolts to the specified torque.

TORQUE: 10 mm bolt: 39 N•m (4.0 kgf•m, 29 lbf•ft)
8 mm bolt: 25 N•m (2.5 kgf•m, 18 lbf•ft)



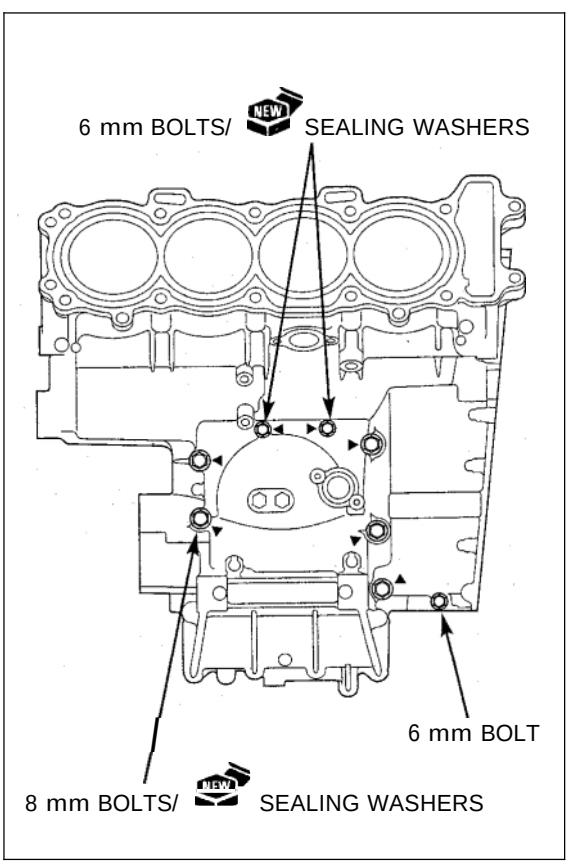
The sealing washer locations are indicated on the upper crankcase using the "A" mark

Install the upper crankcase 8 mm bolts, sealing washers and 6 mm bolt.

Tighten the 8 mm bolts to the specified torque.

TORQUE: 25 N•m (2.5 kgf•m, 18 lbf•ft)

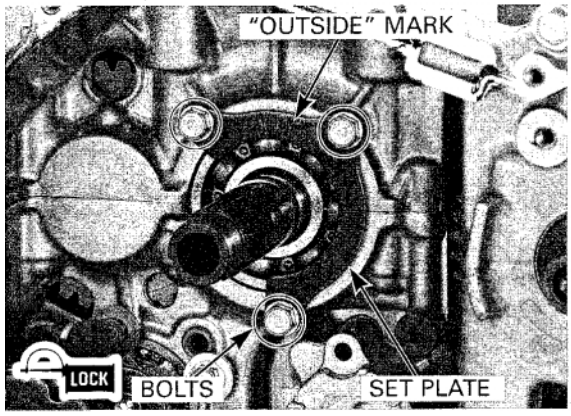
Tighten the 6 mm bolts securely.

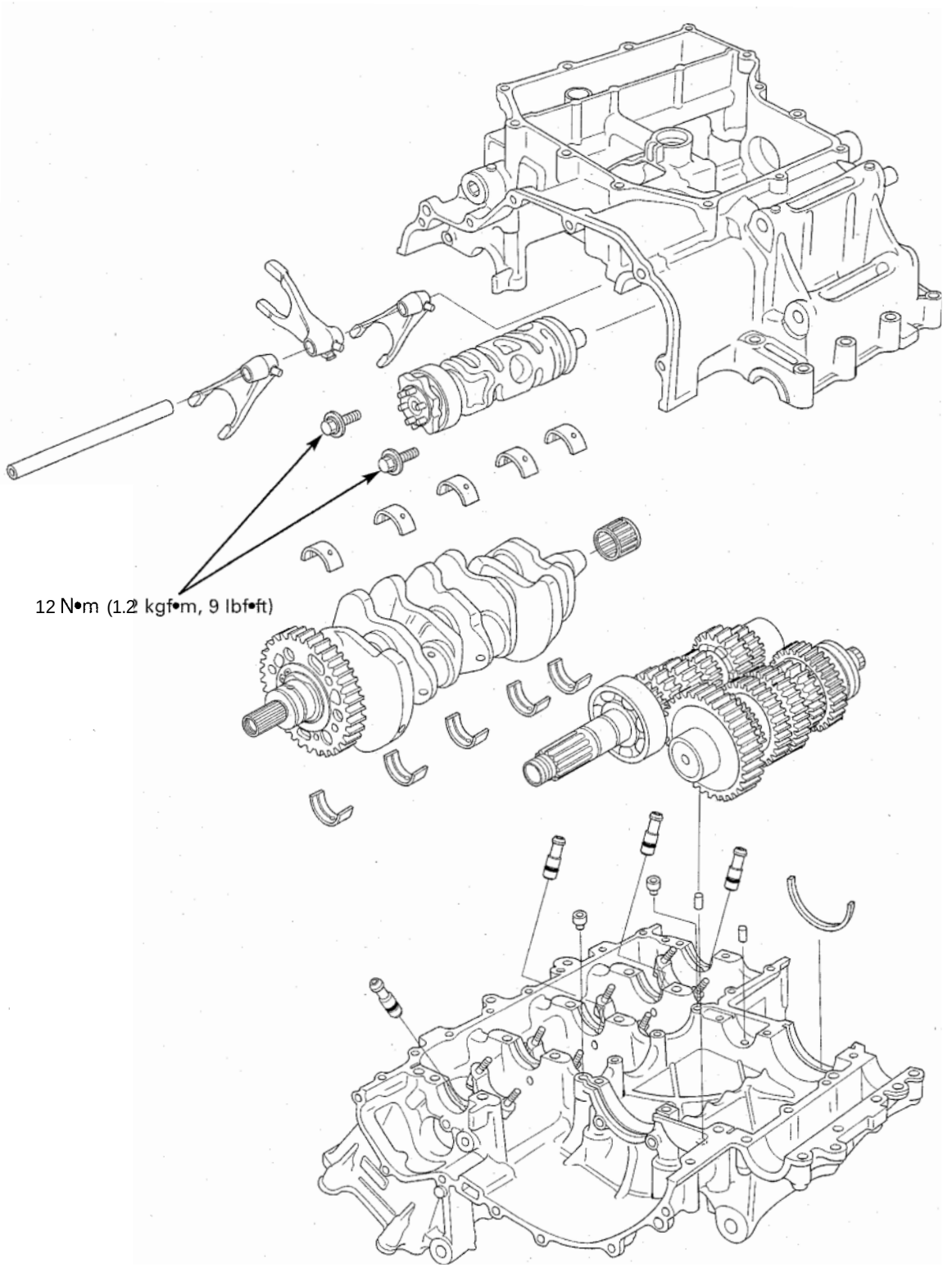


Apply a locking agent to the mainshaft bearing set plate bolt threads.
Install the mainshaft bearing set plate with its "OUTSIDE" mark facing out.
Tighten the mounting bolts to the specified torque.

TORQUE: 12 N•m (1.2 kgf•m, 9 lbf•ft)

Install the removed parts in the reverse order of removal.




12 N•m (1.2 kgf•m, 9 lbf•ft)

12. CRANKSHAFT/TRANSMISSION

SERVICE INFORMATION	12-1	CRANKSHAFT	12-3
TROUBLESHOOTING	12-2	TRANSMISSION	12-9

SERVICE INFORMATION

GENERAL

- The crankcase must be separated to service the crankshaft and transmission. Refer to section 11 for crankcase separation/assembly.
- Be careful not to damage the crankshaft main journal and journal bearing while removing or installing the crankshaft.
- Mark and store the disassembled parts to ensure that they are installed in their original locations.
- Mark and store the bearing inserts to ensure that the parts are in their correct locations during reassembly. If the inserts are improperly installed, they will block the oil holes, causing insufficient lubrication and eventual engine seizure.
- The main journal bearing inserts are a select fit and are identified by color codes. Select replacement bearings from the code tables. After installing new bearings, recheck them with a plastigauge to verify clearance. Apply molybdenum disulfide oil to the main journal during assembly.

SPECIFICATIONS

Unit: mm (in)

ITEM			STANDARD	SERVICE LIMIT
Crankshaft	Side clearance		0.05 – 0.20 (0.002 – 0.008)	0.30 (0.012)
	Runout		—	0.30 (0.012)
	Main journal oil clearance		0.017 – 0.035 (0.0007 – 0.0014)	0.045 (0.0018)
Transmission	Gear I.D.	M5, M6	31.000 – 31.025 (1.2205 – 1.2215)	31.04 (1.222)
		C1	26.000 – 26.021 (1.0236 – 1.0244)	26.04 (1.025)
		c2, C3, C4	33.000 – 33.025 (1.2992 – 1.3002)	33.04 (1.301)
	Bushing O.D.	M5, M6	30.950 – 30.975 (1.2185 – 1.2195)	30.93 (1.218)
		C3, 4	32.950 – 32.975 (1.2972 – 1.2982)	32.93 (1.296)
	Bushing I.D.	M5	27.985 – 28.006 (1.1018 – 1.1026)	28.02 (1.103)
		C2	29.985 – 30.006 (1.1805 – 1.1813)	30.02 (1.182)
	Gear-to-bushing clearance	M5, M6	0.025 – 0.075 (0.0010 – 0.0030)	0.11 (0.004)
		c3, c4	0.025 – 0.075 (0.0010 – 0.0030)	0.11 (0.004)
	Mainshaft O.D.	M5	27.967 – 27.980 (1.1011 – 1.1016)	27.957 (1.1007)
		Clutch outer guide	24.980 – 24.993 (0.9835 – 0.9840)	24.96 (0.983)
	Countershaft O.D.	C2	29.967 – 29.980 (1.1798 – 1.1803)	29.96 (1.180)
	Bushing-to-shaft clearance	M5	0.005 – 0.039 (0.0002 – 0.0015)	0.08 (0.003)
		C2	0.005 – 0.039 (0.0002 – 0.0015)	0.08 (0.003)

TORQUE VALUES

Connecting rod bearing cap nut	35 N•m (3.6 kgf•m, 26 lbf•ft)	Apply oil to the threads and seating surface
Crankcase 9 mm bolt (main journal bolt)	See page 12-7	

TOOLS

Inner driver, 40 mm I.D.	07746–0030100
Attachment, 25 mm	07746–0030200
Driver shaft	07964–MB00200

TROUBLESHOOTING

Excessive noise
- Worn connecting rod big end bearing
- Bent connecting rod
- Worn crankshaft main journal bearing
- Worn transmission bearing

Hard to shift
- Improper clutch operation
- Incorrect transmission oil weight
- Incorrect clutch adjustment
- Bent shift fork
- Bent fork shaft
- Bent fork claw
- Damaged shift drum cam groove
- Bent shift spindle

Transmission jumps out of gear
- Worn gear dogs and slots
- Bent fork shaft
- Broken shift drum stopper
- Worn or bent shift forks
- Broken shift linkage return spring

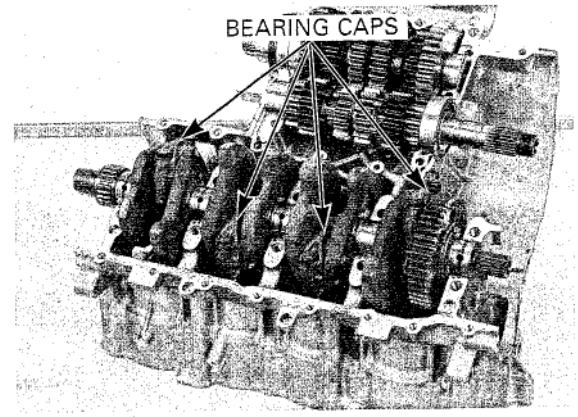
Engine vibration
- Excessive crankshaft runout

CRANKSHAFT

REMOVAL

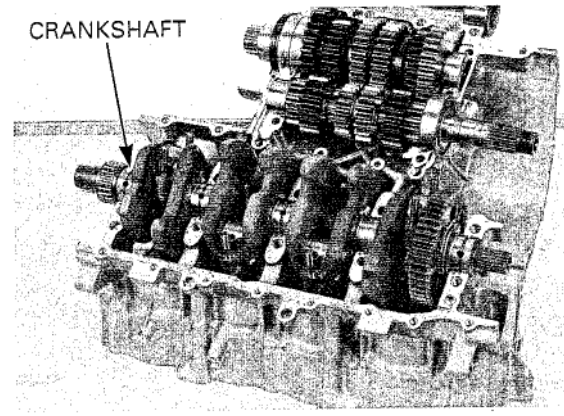
Separate the crankcase halves (page 11-3).

Remove the connecting rod bearing cap nuts and bearing caps.

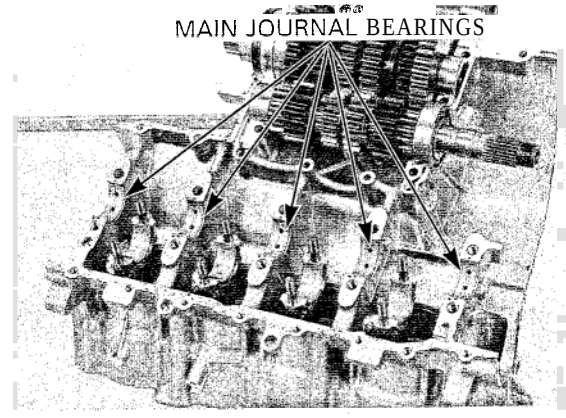


Before removal position all the pistons at TDC (Top Dead Center) to prevent damaging the crankpin with the connecting rod bolt threads

Remove the crankshaft.



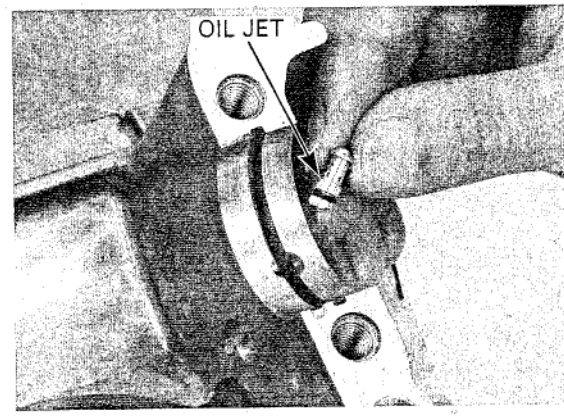
Remove the main journal bearings from both the crankcases.



Remove the crankshaft oil jets from the upper crankcase.

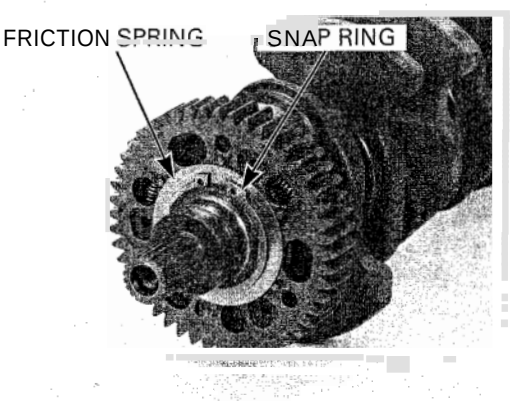
Always replace the O-ring when the oil jets are removed.

Inspect the oil jets for clogs, and replace if necessary.

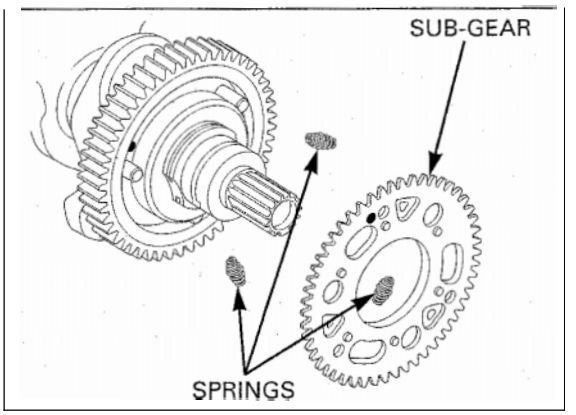


PRIMARY DRIVE SUB-GEAR REMOVAL

Remove the special snap ring and friction spring.



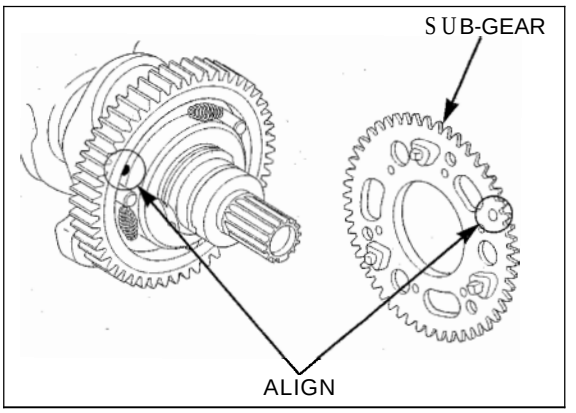
Remove the primary drive sub-gear and springs.



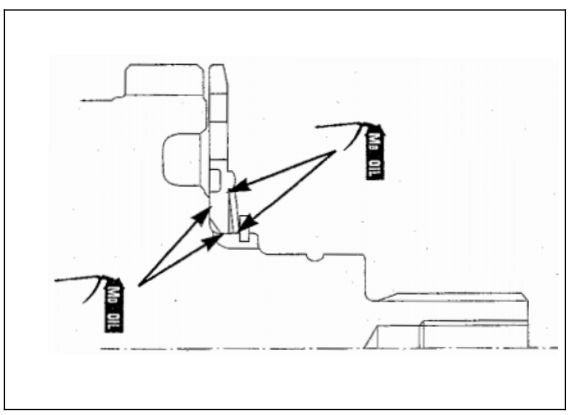
PRIMARY DRIVE SUB-GEAR INSTALLATION

Install the springs into the primary drive gear as shown.

Install the primary drive sub-gear onto the primary drive gear, aligning the holes between the gear.



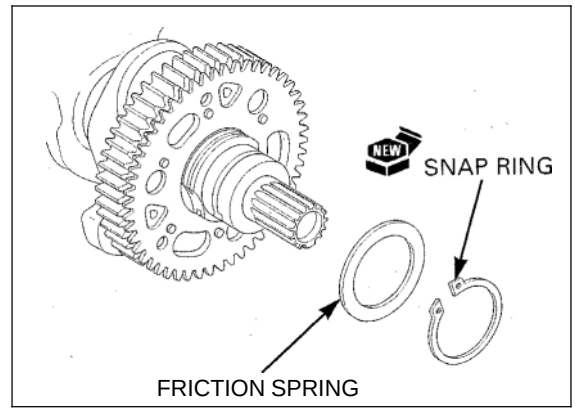
Apply molybdenum disulfide oil to the area shown in the illustration.



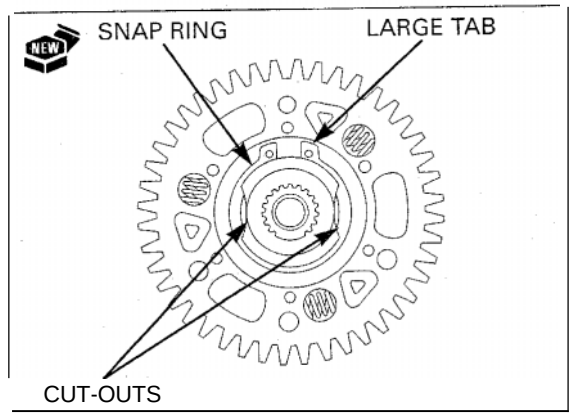
Install the friction spring and new special snap ring.

NOTICE

You must use a new special snap ring. Using a snap ring other than specified or reusing the original snap ring can cause severe engine damage.



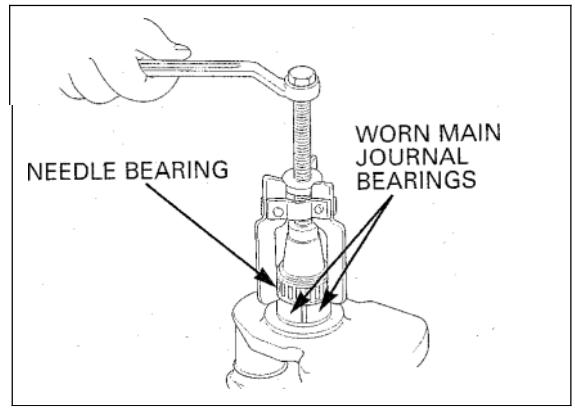
- install a new special snap ring with its large tab facing to the right and the chamfered side facing in.
- Make sure the new special snap ring end gap is aligned with the right angle of the crankshaft cut-outs as shown.



STARTER CLUTCH NEEDLE BEARING REPLACEMENT

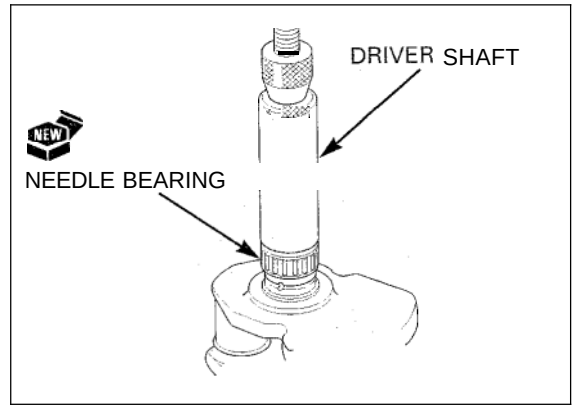
To protect the crankshaft main journal from the bearing puller claws, cover the main journal properly, worn main journal bearings are usable as protectors

Remove the needle bearing with a commercially available universal bearing puller.

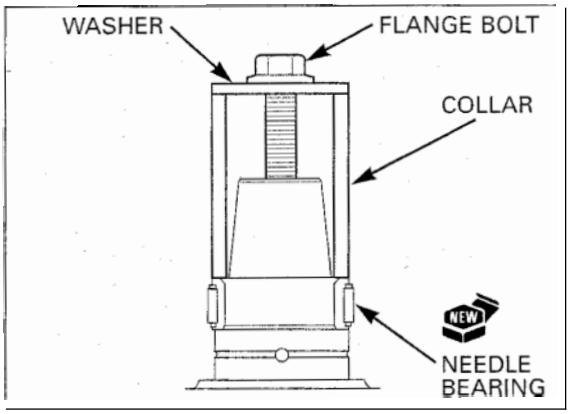


Press a new needle bearing onto the crankshaft using a hydraulic press and special tool.

TOOL:
Driver shaft **07964-NIB00200**



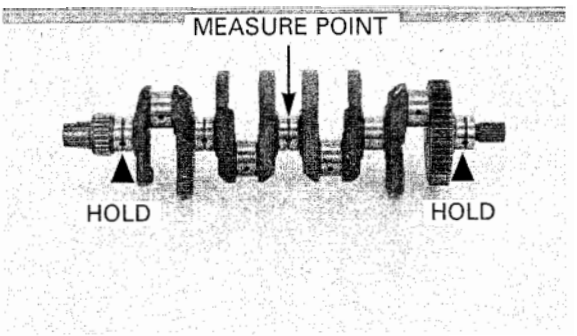
If the special tool is not available, prepare a suitable collar, washer and 10 mm flange bolt (example; flywheel bolt) for the bearing installation.
Assemble the above items, and screw the bolt gradually, until the new needle bearing is properly installed.



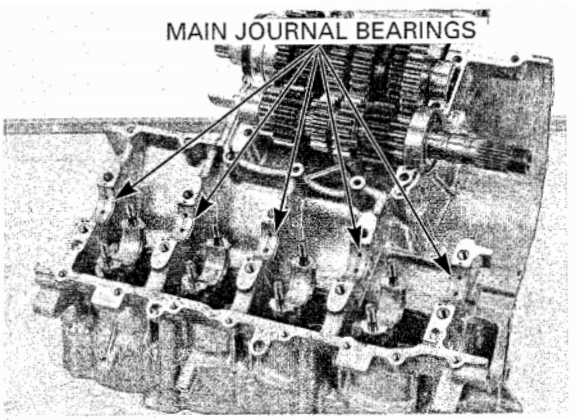
INSPECTION

CRANKSHAFT RUNOUT
Support the crankshaft on both ends.
Set a dial indicator on the center main journal of the crankshaft.
Rotate the crankshaft two revolutions and read runout at the center journal.

SERVICE LIMIT: 0.30 **mm (0.012 in)**

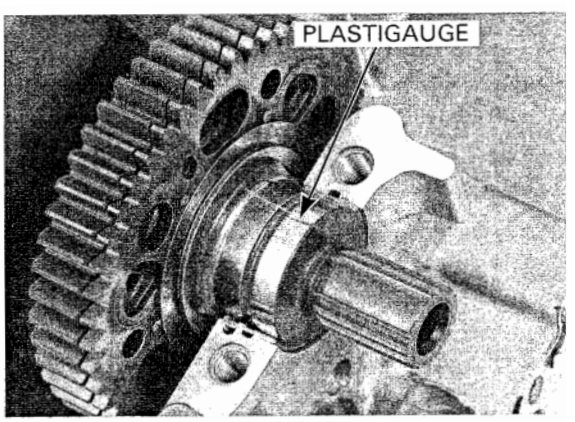


MAIN JOURNAL BEARING
Inspect the main journal bearing inserts for damage or separation.



Wipe the oil from the bearing inserts and journals.
Reinstall the upper crankcase's main journal bearing inserts, then carefully lower the crankshaft in place.
Put a piece of plastigauge on each journal.

- Do not put the plastigauge over the oil hole in the main bearing journal of the crankshaft.
- Do not rotate the crankshaft during inspection.



Assemble the crankcase halves.

PLASTIC REGION TIGHTENING METHOD:
Install the removed main journal 9 mm bolts.

Tighten the main journal 9 mm bolts as follow:

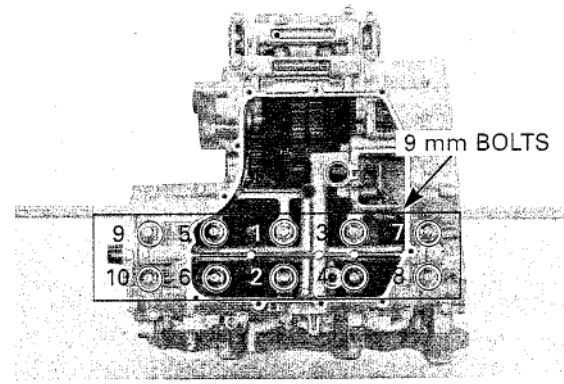
Tighten the 9 mm bolts in numerical order in the illustration to the following torque.

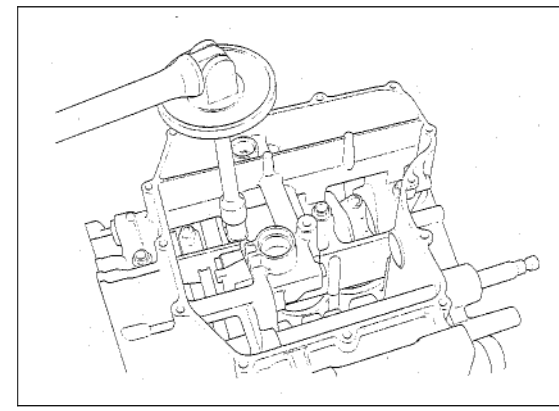
TORQUE: 10 N·m (1.0 kgf·m, 7 lbf·ft)

Retighten the 9 mm bolts in the same order above to the following torque.

TORQUE: 20 **N·m (2.0 kgf·m, 14 lbf·ft)**

Further tighten the 9 mm bolts 150 degrees.

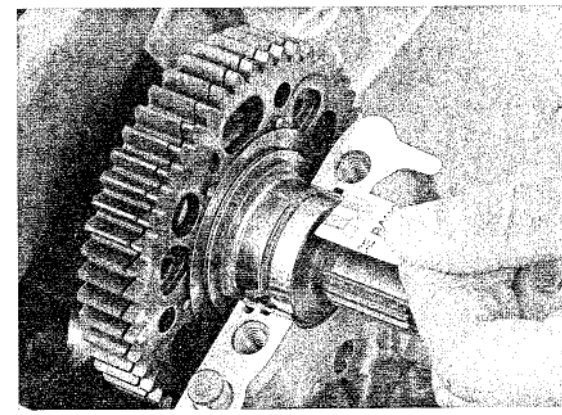




Remove the 9 mm bolts and lower crankcase.
Measure the compressed plastigauge on each journal.

SERVICE LIMIT: **0.045 mm (0.0018 in)**

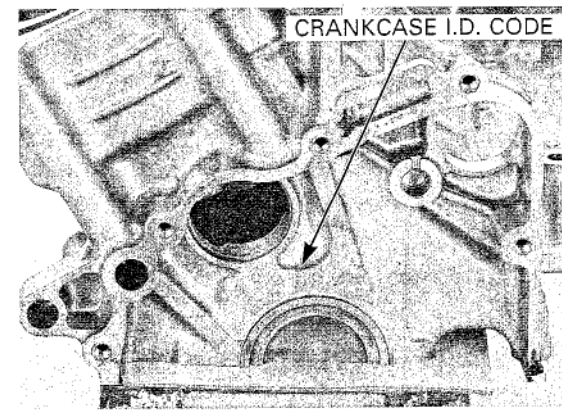
If main bearing clearance is beyond tolerance, select a replacement bearing.



MAIN JOURNAL BEARING SELECTION

The letters (A, B or C) on the upper crankcase are the codes for the main journal I D s from left to right

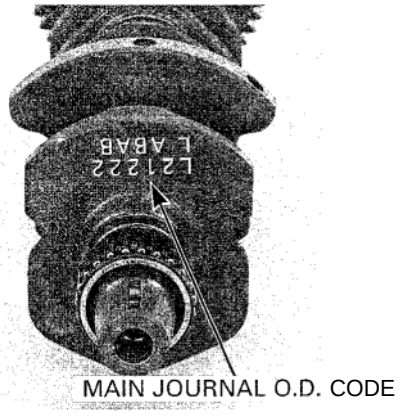
Record the crankcase I.D. letters from the pad on the left side of the upper crankcase as shown.



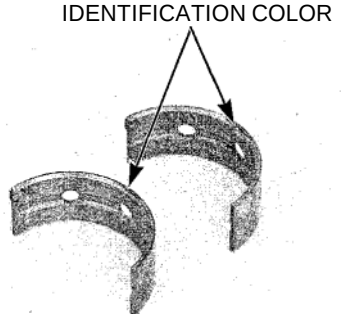
The numbers (0, 1, 2 or 3) on the crank weiaht are the codes for the main journal O D s from left to right

Record the corresponding main journal O.D. code numbers from the crank weight.

Cross reference the case and journal codes to determine the replacement bearing color codes.



BEARING THICKNESS:
B (Brown): Thick
C (Green):
D (Yellow):
E (Pink):
F (Red):
G (White): Thin



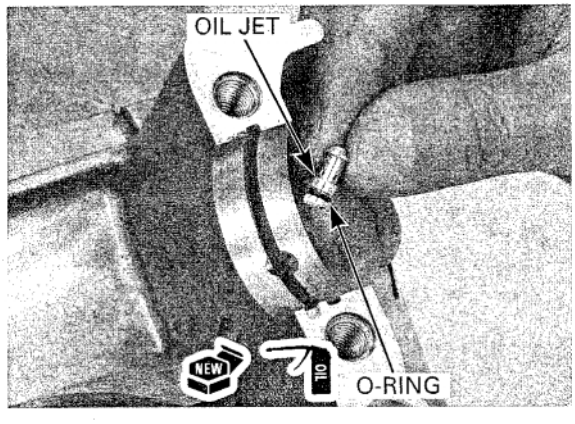
NOTICE

After selecting new bearings, recheck the clearance with a plastigauge. Incorrect clearance can cause severe engine damage.

			B	C
MAIN JOURNAL O.D. CODE	0	(White)	(Red)	
	1	F (Red)	E (Pink)	D (Yellow)
	2	E (Pink)	D (Yellow)	C (Green)
	3	D (Yellow)	C (Green)	B (Brown)

INSTALLATION

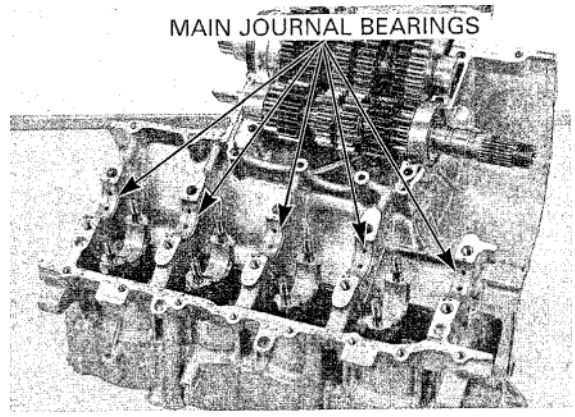
Apply engine oil to the new O-ring and install it to the oil jet.
Install the crankcase oil jets into the lower crankcase main journal.



The bearing tabs should be aligned with the grooves in the case.

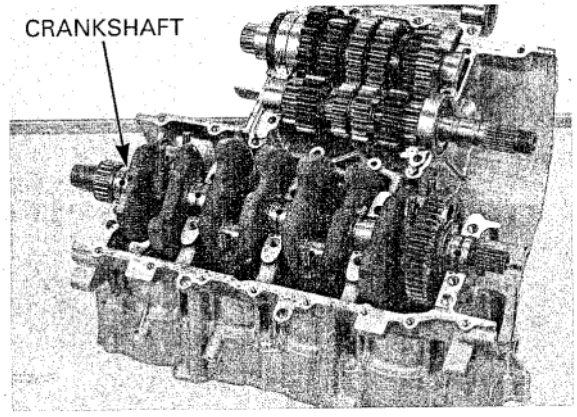
Install the main journal bearings into the upper and lower crankcase.

Apply 'molybdenum disulfide oil to the upper and lower main journal bearings.



Before installation, position all the pistons at TDC (Top Dead Center) to prevent damaging the crankpin with the connecting rod threads

Install the crankshaft.



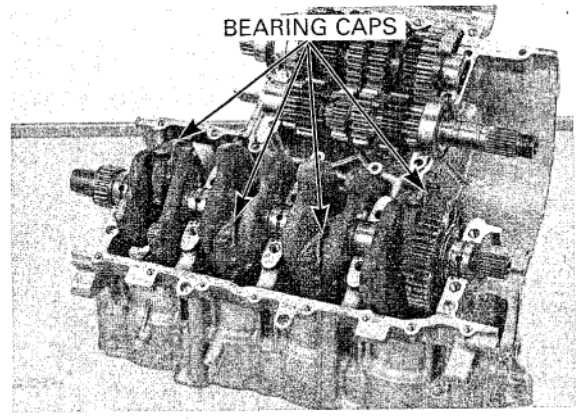
Install the connecting rod bearing caps.

Apply oil to the connecting rod bearing cap nut threads and seating surfaces.

Install and tighten the nuts gradually and alternately.

TORQUE: 35 N•m (3.6kgf•m, 26 lbf•ft)

Assemble the upper and lower crankcase (page 11-12).

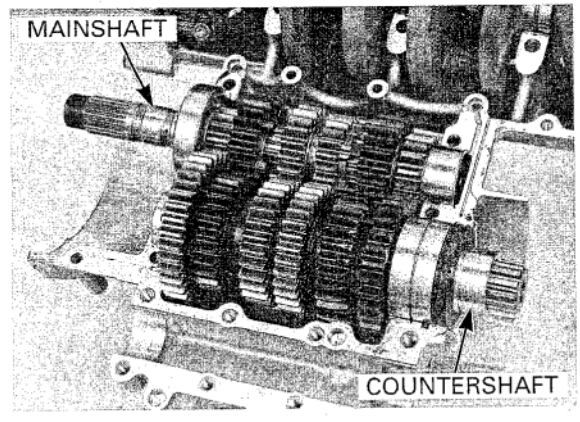


TRANSMISSION

REMOVAL/DISASSEMBLY

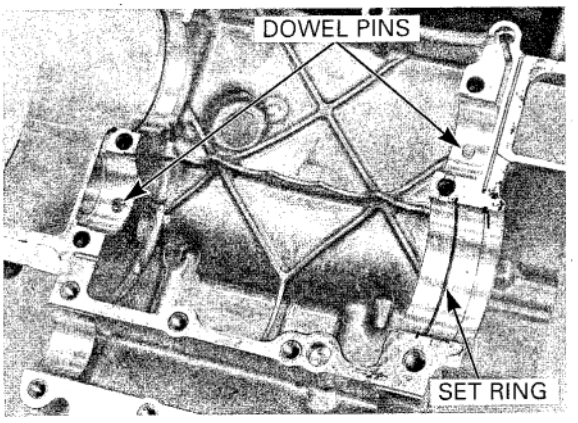
Separate the crankcase halves (page 11-3).

Remove the mainshaft and countershaft as an assembly.



Remove the dowel pins and countershaft bearing set ring.

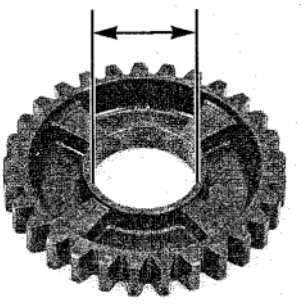
Disassemble the mainshaft and countershaft.



Check the gear dogs, dog holes and teeth for abnormal wear or lack of lubrication.
Measure the I.D. of each gear.

SERVICE LIMITS:

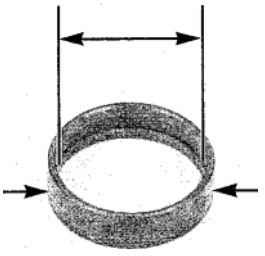
M5, M6:	**31.04 mm**	**1.222 in)**
C1:	**26.04 mm**	**1.025 in)**
C2, C3, C4:	**33.04 mm**	**1.301 in)**



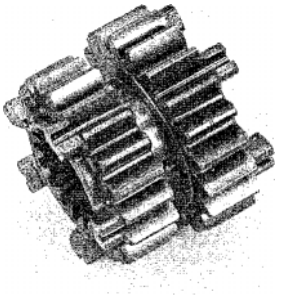
Measure the I.D. and O.D. of each gear bushing.

SERVICE LIMITS:

O.D.:	**M5, M6:**	**30.93 mm (1.218 in)**
	C3, C4:	**32.93 mm (1.296 in)**
I.D.:	**M5:**	**28.02 mm (1.103 in)**
	C2:	**30.02 mm (1.182 in)**



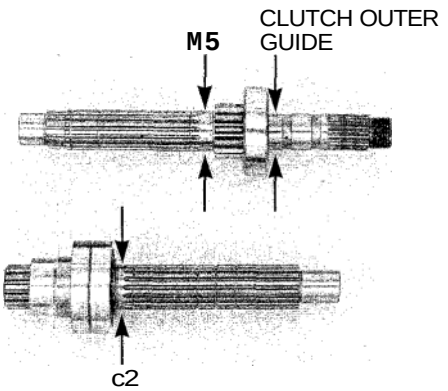
Check the shift fork groove of the shifter gear for excessive wear or damage.



Measure the O.D. of the mainshaft and countershaft.

SERVICE LIMITS:

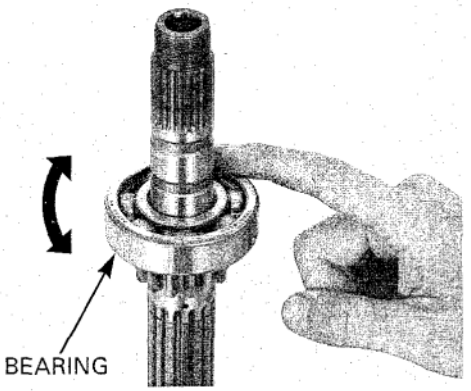
M5:	**27.957 mm (1.1007 in)**
Clutch outer guide:	**24.96 mm (0.983 in)**
c2:	**29.96 mm (1.180 in)**



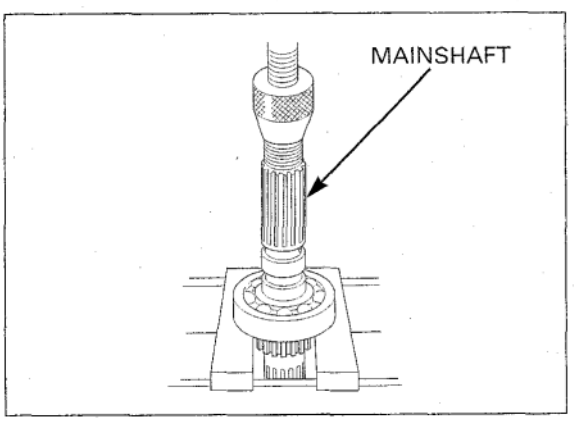
Do not try to remove the countershaft bearing from the shaft If the bearing is worn or damaged, replace the countershaft as an assembly.

BEARING REPLACEMENT

Turn the outer race of each bearing with your finger. The bearings should turn smoothly and quietly.
Also check that the bearing inner race fits tightly on the shaft.
Remove and discard the mainshaft bearing, if the race does not turn smoothly, quietly, or fits loosely on the mainshaft.
Replace the countershaft, collar, and bearing as an assembly, if the race does not turn smoothly, quietly, or fits loosely on the countershaft.



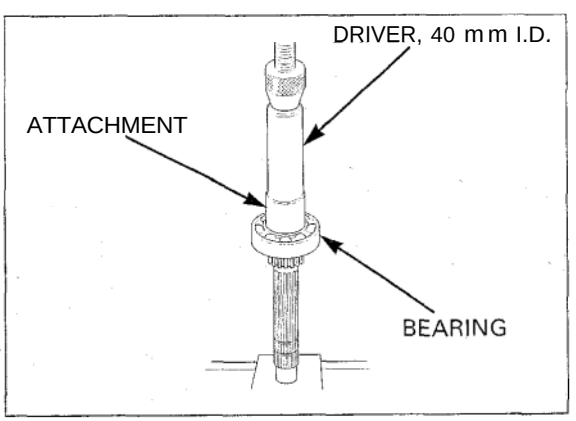
Press out the mainshaft from the bearing using a hydraulic press.



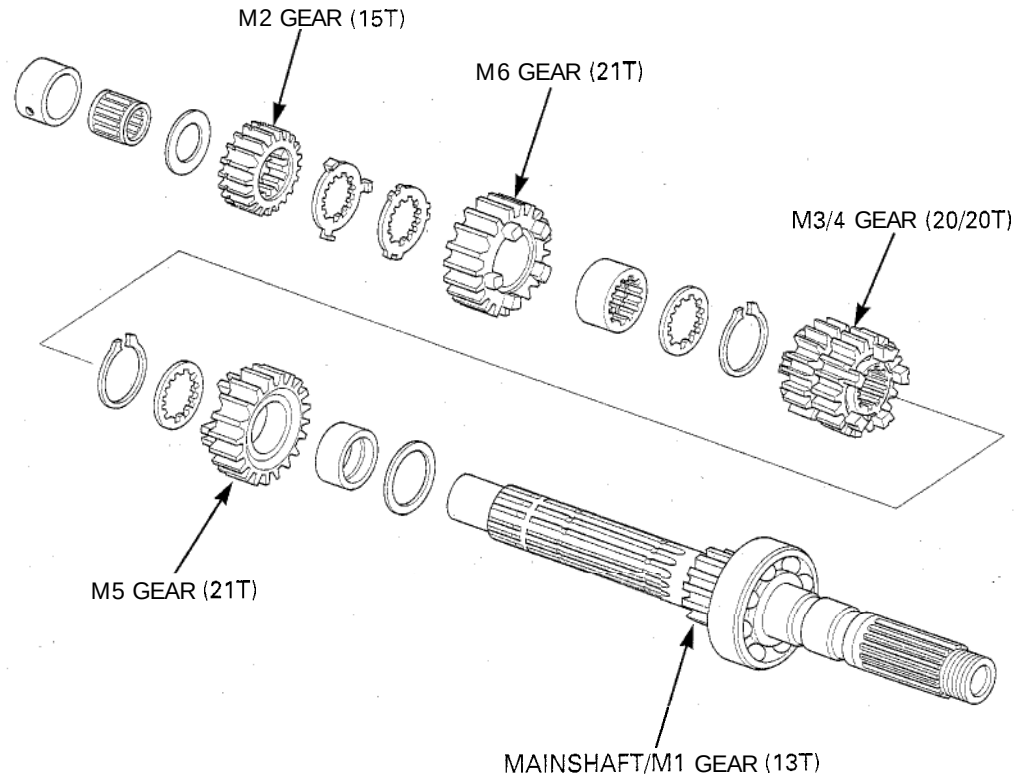
Install a new mainshaft bearing onto the mainshaft by pressing the mainshaft bearing inner race using the special tool.

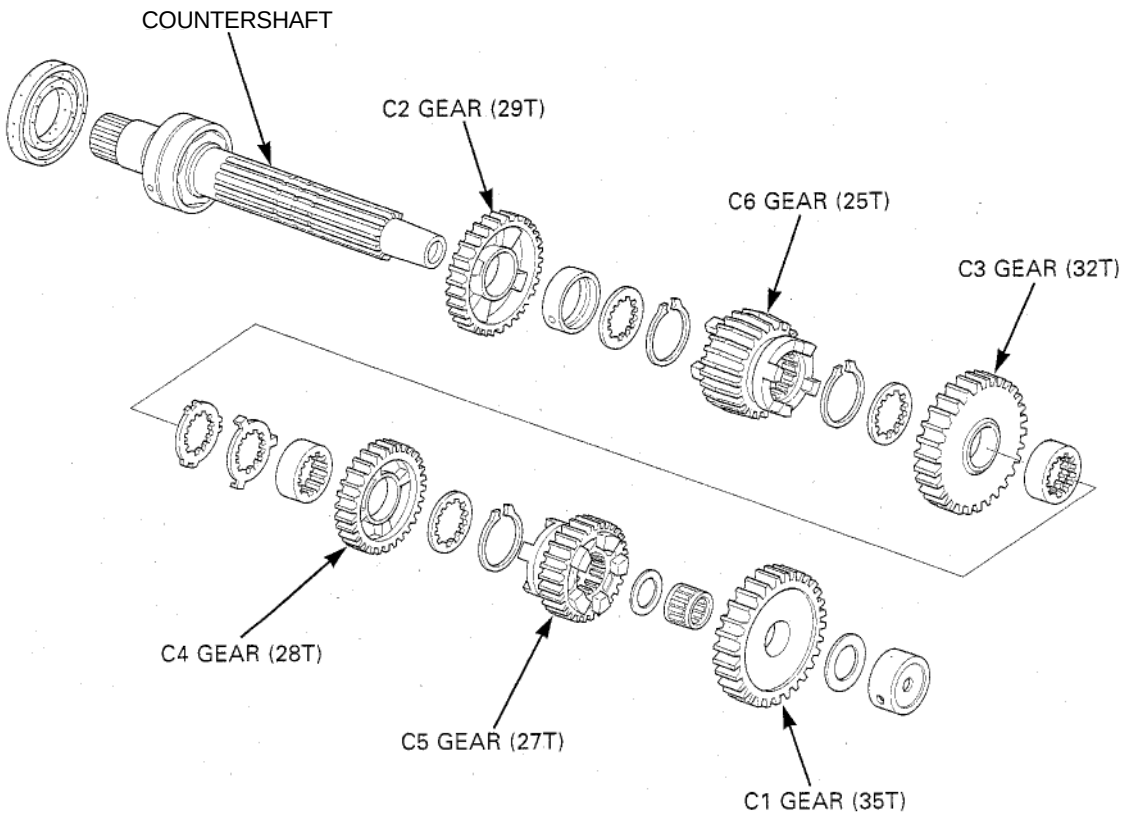
TOOLS:

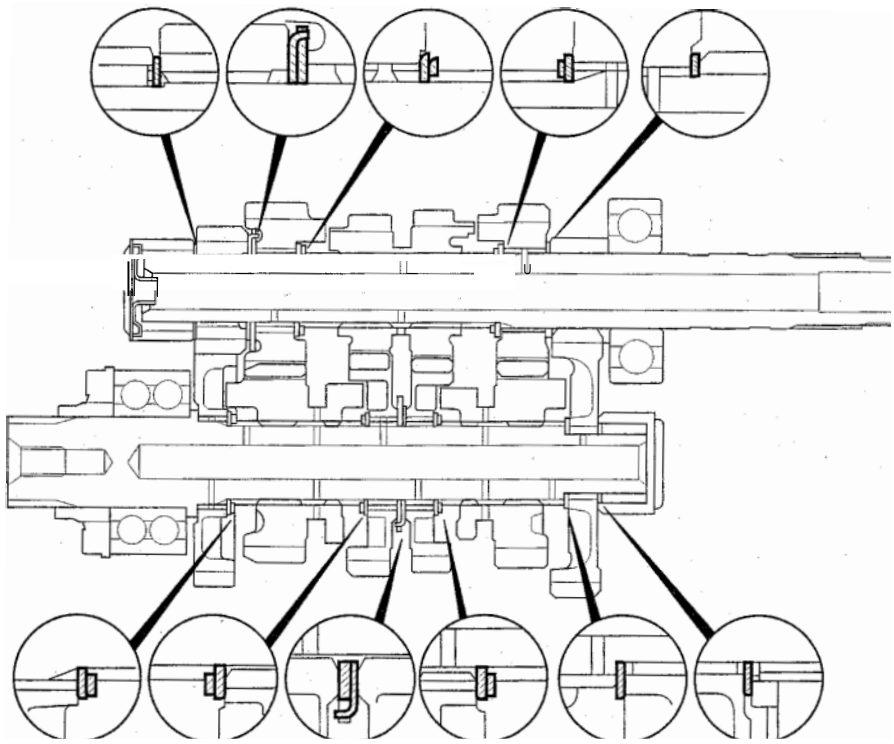
Inner driver, 40 mm I.D.	**07746–0030100**
Attachment, 25 mm	**07746–0030200**



ASSEMBLY

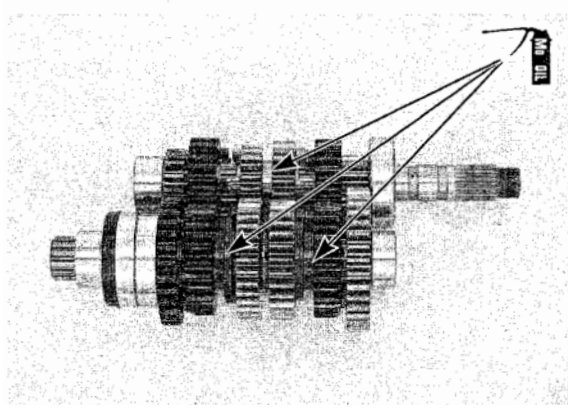

M2 GEAR (15T)
M6 GEAR (21T)
M3/4 GEAR (20/20T)
M5 GEAR (21T)
MAINSHAFT/M1 GEAR (13T)


COUNTERSHAFT
C2 GEAR (29T)
C6 GEAR (25T)
C3 GEAR (32T)
C4 GEAR (28T)
C5 GEAR (27T)
C1 GEAR (35T)



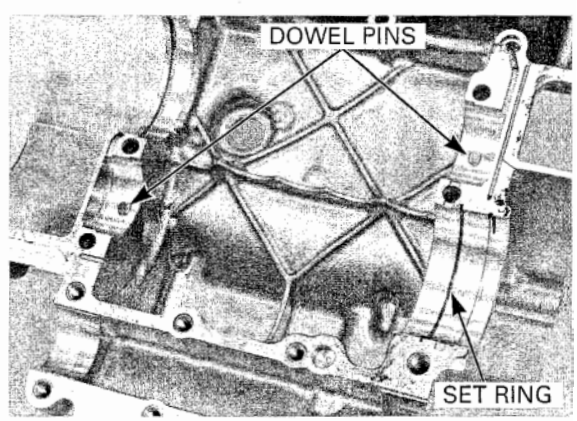
Assemble the transmission gear and shafts.
Coat each gear with clean engine oil and check for smooth movement.

Apply molybdenum disulfide oil to the shift fork grooves in the M3/4, C5 and C6 gear.

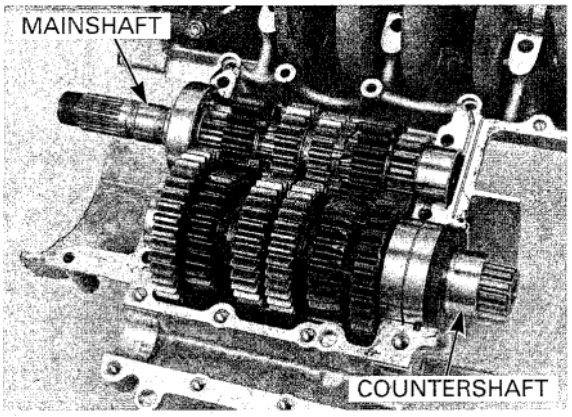


INSTALLATION

Install the dowel pins in the upper crankcase holes.
Install the countershaft bearing set ring into the upper crankcase groove.

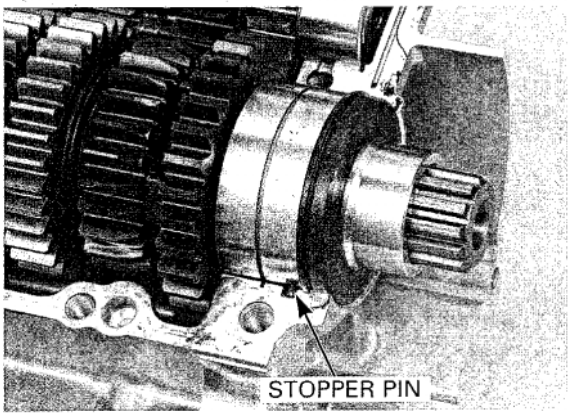


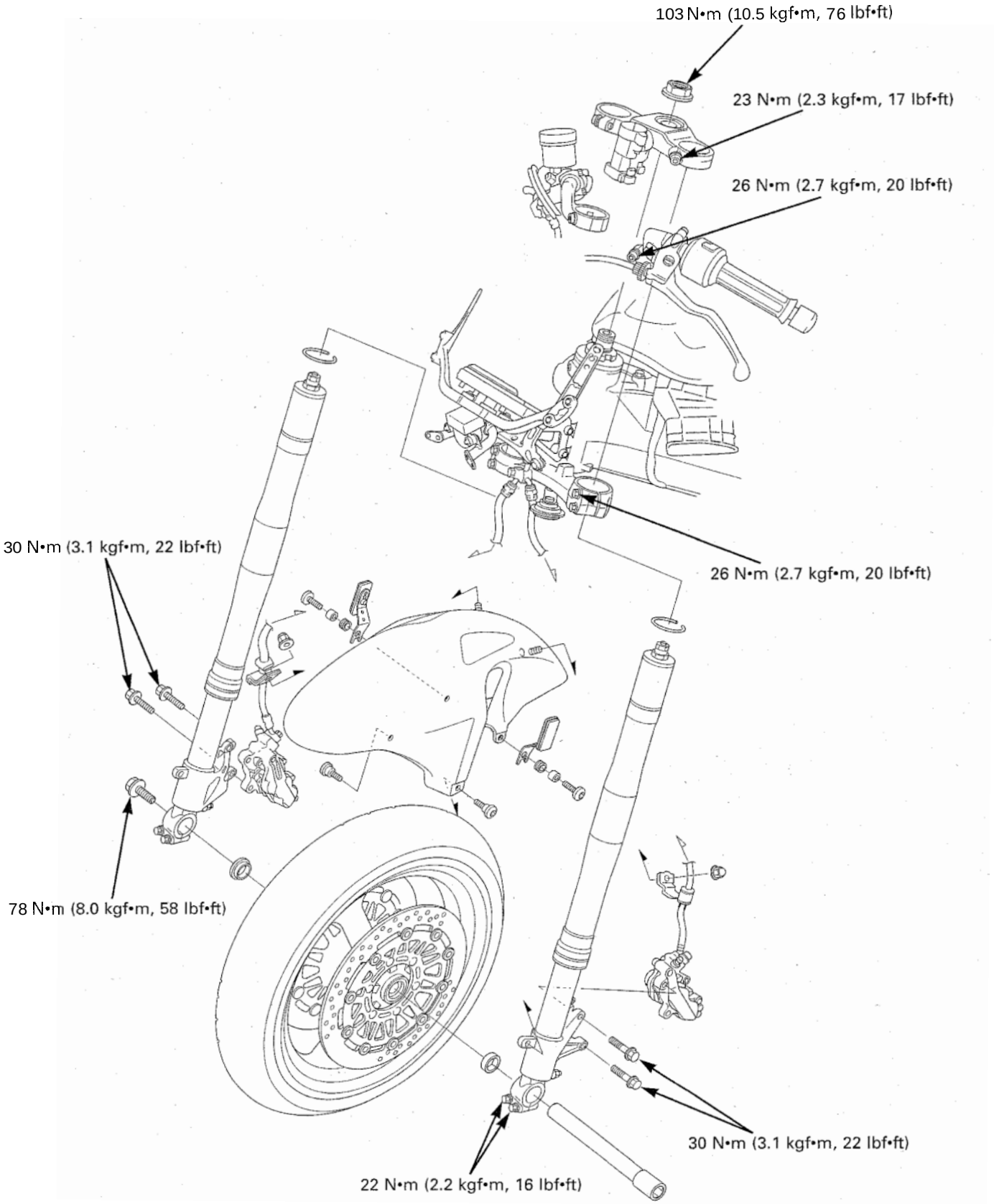
Install the mainshaft and countershaft by aligning the countershaft bearing groove with the set ring on the crankcase, and aligning the bearing cap holes with the dowel pins.



Also align the countershaft bearing stopper pin with the groove in the crankcase.

Assemble the crankcase (page 11-12).




103 N•m (10.5 kgf•m, 76 lbf•ft)
23 N•m (2.3 kgf•m, 17 lbf•ft)
26 N•m (2.7 kgf•m, 20 lbf•ft)
30 N•m (3.1 kgf•m, 22 lbf•ft)
26 N•m (2.7 kgf•m, 20 lbf•ft)
78 N•m (8.0 kgf•m, 58 lbf•ft)
30 N•m (3.1 kgf•m, 22 lbf•ft)
22 N•m (2.2 kgf•m, 16 lbf•ft)

13. FRONT WHEEL/SUSPENSION/STEERING

SERVICE INFORMATION	13-1	FRONT WHEEL	13-9
TROUBLESHOOTING	13-3	FORK	13-15
HANDLEBARS	13-4	STEERING STEM	13-26

SERVICE INFORMATION

GENERAL

- When servicing the front wheel, fork or steering stem, support the motorcycle using a safety stand or hoist.
- A contaminated brake disc or pad reduces stopping power. Discard contaminated pads and clean a contaminated disc with a high quality brake degreasing agent.
- After front wheel installation, check the brake operation by applying the brake lever.
- Refer to section 15 for brake system information.
- Use only tires marked "TUBELESS" and tubeless valves on rims marked "TUBELESS TIRE APPLICABLE".

SPECIFICATIONS

Unit: mm (in)

ITEM		STANDARD	SERVICE LIMIT
Minimum tire tread depth		—	1.5 (0.06)
Cold tire pressure	Up to 90 kg (200 lb) load	250 kPa (2.50 kgf/cm², 36 psi)	—
	Up to maximum weight capacity	250 kPa (2.50 kgf/cm², 36 psi)	—
Axle runout		—	0.20 (0.008)
Wheel rim runout	Radial	—	2.0 (0.08)
	Axial	—	2.0 (0.08)
Wheel balance weight		—	60 g (2.1 oz) max.
Fork	Spring free length	255.8 (10.07)	250.8 (9.87)
	Spring direction	With the tapered end facing up	—
	Fork pipe runout	—	0.20 (0.008)
	Recommended fork fluid	Pro Honda Suspension Fluid SS-8	—
	Fluid level	73 (2.9)	—
	Fluid capacity	513 ± 2.5 cm³ (17.3 ± 0.08 US oz, 18.1 ± 0.09 Imp oz)	—
	Pre-load adjuster initial setting	7 turns from full soft	—
	Tension adjuster initial setting	2 turns from full hard	—
	Compression adjuster initial setting	2 turns from full hard	—
Steering head bearing pre-load		11 – 16 N (1.1 – 1.6 kgf)	—

TORQUE VALUES

Handlebar pinch bolt	26 N•m (2.7 kgf•m, 20 lbf•ft)	
Handlebar weight mounting screw	10 N•m (1.0 kgf-m, 7 lbf•ft)	ALOC bolt
Front master cylinder holder bolt	12 N•m (1.2 kgf-m, 9 lbf•ft)	
Clutch lever bracket pinch bolt	12 N•m (1.2 kgf•m, 9 lbf•ft)	
Steering stem nut	103 N•m (10.5 kgf-m, 76 lbf•ft)	See page 13-33
Steering stem adjusting nut		
Steering stem lock nut		
Fork top bridge pinch bolt	23 N•m (2.3 kgf-m, 17 lbf•ft)	
Fork bottom bridge pinch bolt	26 N•m (2.7 kgf-m, 20 lbf•ft)	
Front axle bolt	78 N•m (8.0 kgf-m, 58 lbf•ft)	
Front axle holder pinch bolt	22 N•m (2.2 kgf-m, 16 lbf•ft)	
Front brake disc mounting bolt	20 N•m (2.0 kgf•m, 14 lbf•ft)	ALOC bolt
Fork bolt	22 N•m (2.2 kgf•m, 16 lbf•ft)	
Fork socket bolt	34 N•m (3.5 kgf-m, 25 lbf•ft)	Apply a locking agent to the threads.
Damper rod adjust case lock nut	25 N•m (2.6 kgf-m, 19 lbf•ft)	
Front brake caliper mounting bolt	30 N•m (3.1 kgf-m, 22 lbf•ft)	ALOC bolt

TOOLS

Steering stem socket	07916-3710101	or 07916-3710100 (U.S.A. only)
Driver attachment, A	07946-KM90100	Not available in U.S.A.
Driver attachment, B	07NMF-MT70120	
Driver shaft assembly	07946-KM90300	
Bearing remover, A	07946-KM90401	
Bearing remover, B	07NMF-MT70110	
Assembly base	07946-KM90600	
Steering stem driver	07946-MB00000	
Fork damper holder	07YMB-MCF0101	
Fork damper holder handle	07TMB-001010A	
Oil seal driver	07YMD-MCF0100	or 07NMD-KZ3010A (U.S.A. only)
Driver	07749-0010000	
Attachment, 42 x 47 mm	07746-0010300	
Pilot, 25 mm	07746-0040600	
Bearing remover shaft	07746-0050100	
Bearing remover head, 25 mm	07746-0050800	
Main bearing driver attachment	07946-ME90200	
Fork seal driver body	07947-KA50100	
Oil seal driver	07965-MA60000	
Installer shaft	07VMF-KZ30200	
Installer attachment A	07VMF-MAT0100	(U.S.A. only)
Installer attachment B	07VMF-MAT0200	(U.S.A. only)
Remover attachment A	07VMF-MAT0300	(U.S.A. only)
Remover attachment B	07VMF-MAT0400	(U.S.A. only)

TROUBLESHOOTING

Hard steering
- Faulty or damaged steering head bearings
- Insufficient tire pressure
- Steering head bearing adjustment nut too tight

Steers to one side or does not track straight
- Unevenly adjusted right and left fork legs
- Bent fork
- Bent axle
- Wheel installed incorrectly
- Faulty steering head bearings
- Bent frame
- Worn wheel bearing
- Worn swingarm pivot components

Front wheel wobbling
- Bent rim
- Worn front wheel bearings
- Faulty tire
- Unbalanced tire and wheel

Wheel turns hard
- Faulty wheel bearing
- Bent front axle
- Brake drag

Soft suspension
- Insufficient fluid in fork
- Weak fork springs
- Tire pressure too low

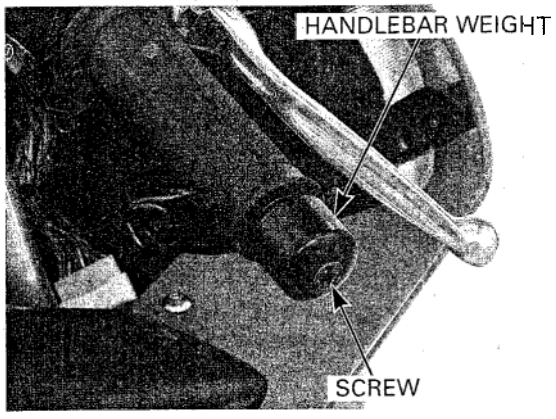
Hard suspension
- Incorrect fluid weight
- Bent fork pipes
- Clogged fork fluid passage

Front suspension noisy
- Insufficient fluid in fork
- Loose fork fasteners

HANDLEBARS

REMOVAL

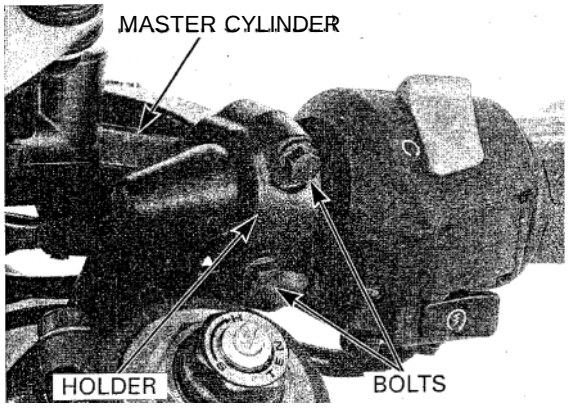
Remove the screw and right handlebar weight.



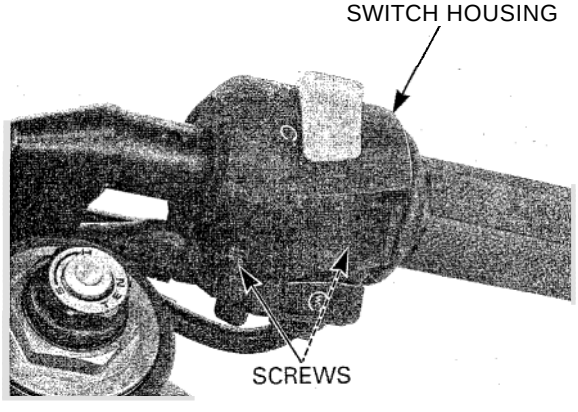
Disconnect the front brake switch wires connectors from the switch.

Keep the brake master cylinder upright

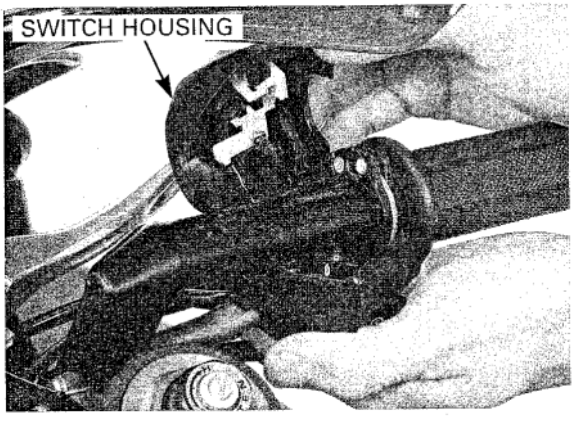
Remove the master cylinder holder bolts, holder and master cylinder assembly.



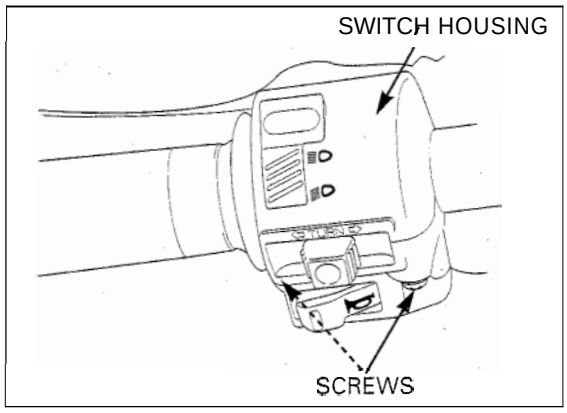
Remove the right handlebar switch housing screws.



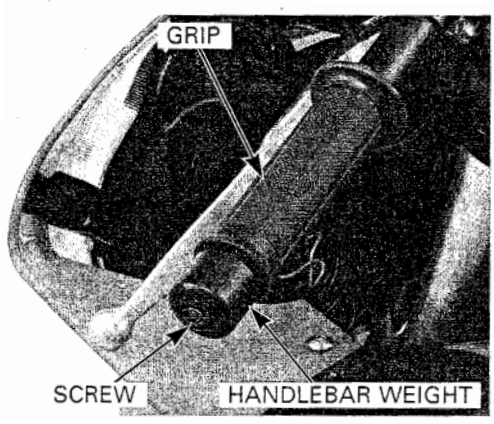
Remove the right handlebar switch housing from the right handlebar.



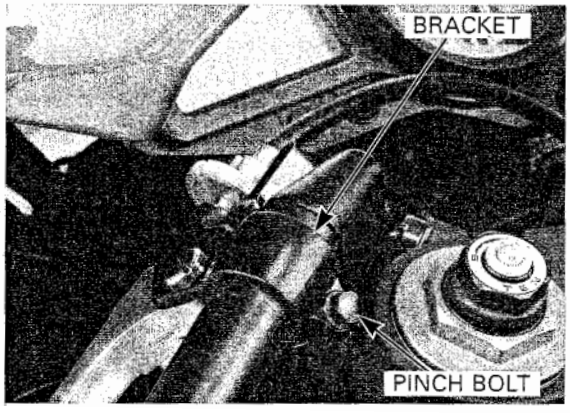
Remove the screws and left handlebar switch housing



Remove the screw and handlebar weight.
Remove the handle grip from the handlebar.

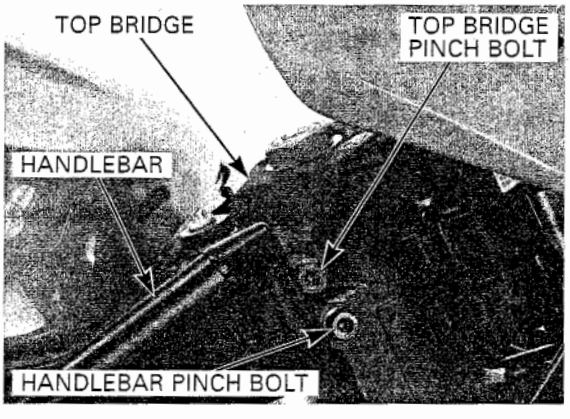


Loosen the clutch lever bracket pinch bolt



Loosen the top bridge pinch bolts and handlebar pinch bolt.
Remove the steering stem nut and top bridge.
Remove the handlebars from the fork sliders.

Remove the throttle pipe from the right handlebar, and also the clutch lever bracket from the left handlebar.

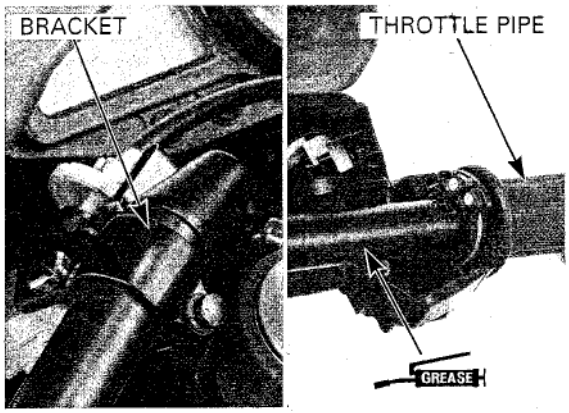


INSTALLATION

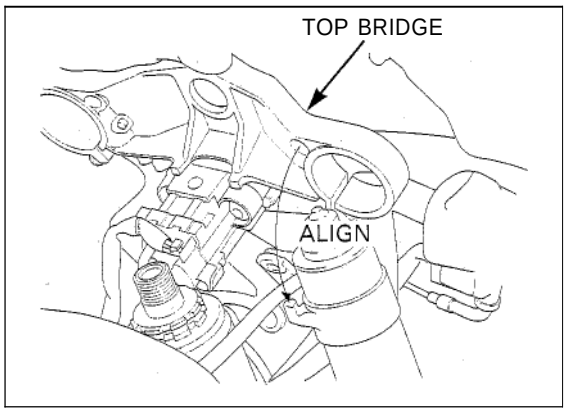
Apply grease to the sliding surface of the throttle pipe.

Install the clutch lever bracket to the left handlebar, and also the throttle pipe to the right handlebar.

Install the handlebars onto the fork sliders.

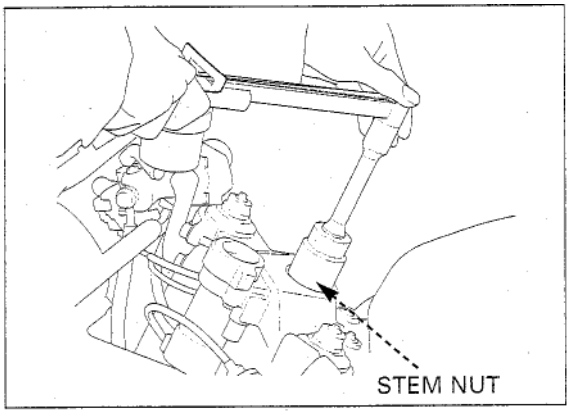


Install the top bridge while aligning its holes with the handlebar stopper pins.



Install and tighten the steering stem nut to the specified torque.

TORQUE: 103 N•m (10.5 kgf•m, 76 lbf•ft)

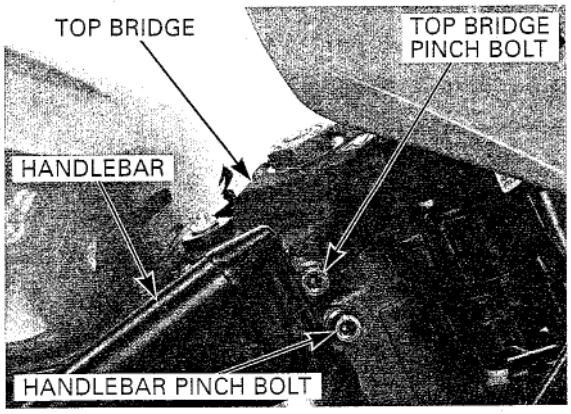


Tighten the top bridge pinch bolts to the specified torque.

TORQUE: 23 N•m (2.3 kgf•m, 17 lbf•ft)

Seat the handlebar pivot upper surface with the top bridge lower surface, then tighten the handlebar pinch bolt to the specified torque.

TORQUE: 26 N•m (2.7 kgf•m, 20 lbf•ft)

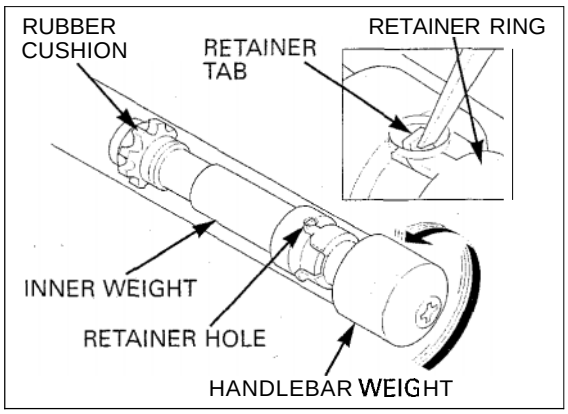


HANDLEBAR WEIGHT REPLACEMENT

Remove the grip rubber from the handlebar.
Straighten the weight retainer tab by the screwdriver or punch.

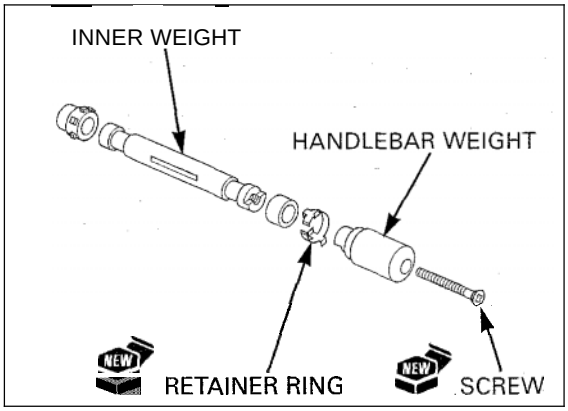
Apply lubricant spray through rhe tab locking hole to the rubber for easy removal

Temporarily install the handlebar weight and screw, then remove the inner weight by turning the handlebar weight.

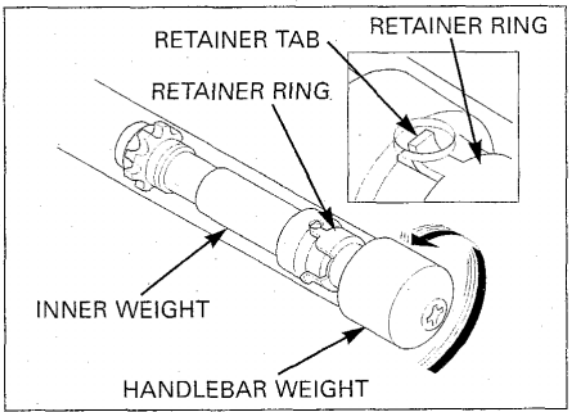


Remove the handlebar weight from the inner weight.
Discard the retainer.

Install the new retainer onto the inner weight.
Install the handlebar weight onto the inner weight, aligning the bosses and grooves each other.
Install a new mounting screw.



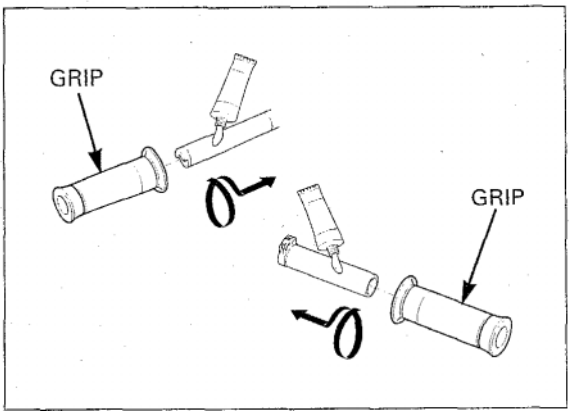
Insert the handlebar weight assembly into the handlebar.
Turn the handlebar weight and hook the retainer tab with the hole in the handlebar.



Apply londa Bond A to the inside c the grip and to the clean surfaces of the left handlebar and throttle grip.

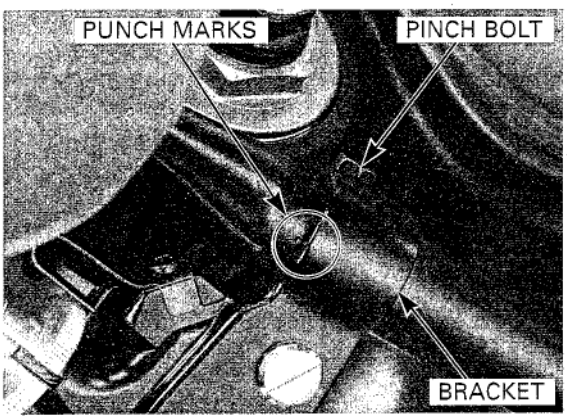
Wait 3 – 5 minutes and install the grip.
Rotate the grip for even application of the adhesive

Allow the adhesive to dry for approximately 1 hour before using

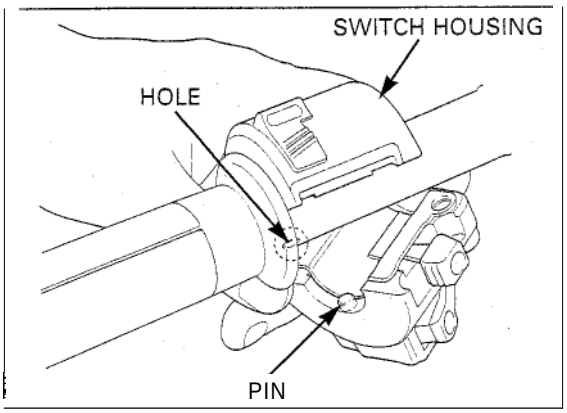


Tighten the clutch lever bracket pinch bolt by aligning the punch marks on the left handlebar and clutch lever bracket.

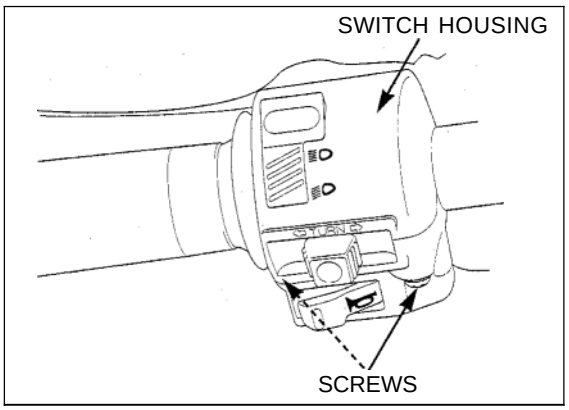
TORQUE: 12 N•m (1.2 kgf•m, 9 lbf•ft)



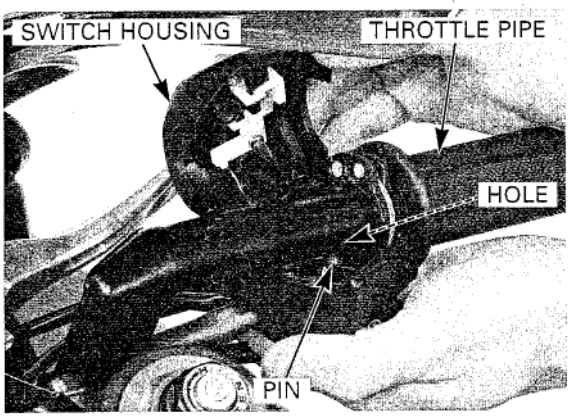
Install the left handlebar switch housing aligning its locating pin with the hole in the handlebar.



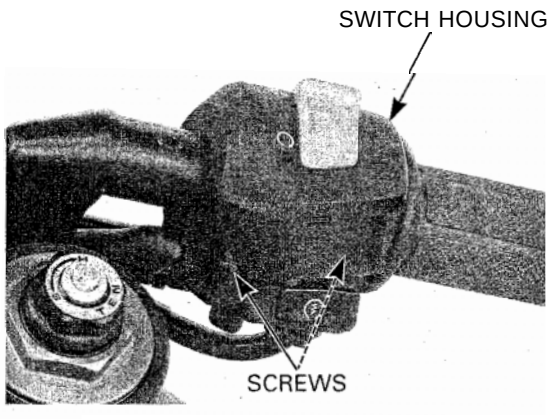
Tighten the forward screw first, then the rear screw.



Install the right handlebar switch housing by aligning its locating pin with the hole in the handlebar.



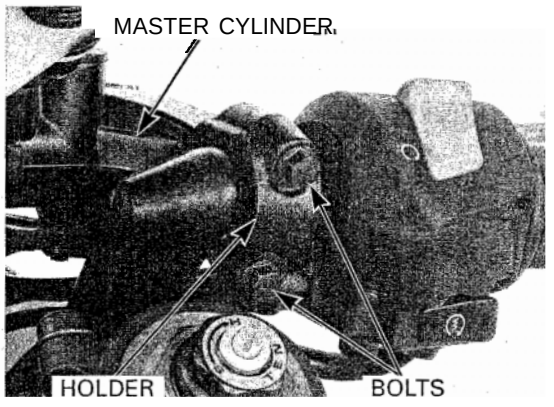
Tighten the forward screw first, then the rear screw.



Install the master cylinder by aligning the end of the master cylinder with the punch mark on the handlebar.
Install the master cylinder holder with the "UP" mark facing up.
Tighten the upper bolt first, the lower bolt.

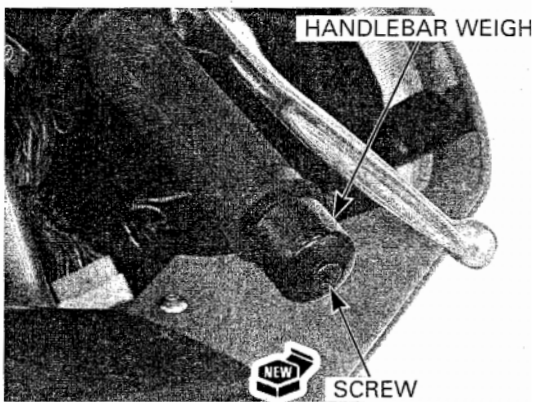
TORQUE: 12 N·m (1.2 kgf·m, 9 lbf·ft)

Connect the brake switch wires.



Install the handlebar weight and tighten the new mounting screw to the specified torque.

TORQUE: 10 N·m (1.0 kgf·m, 7 lbf·ft)

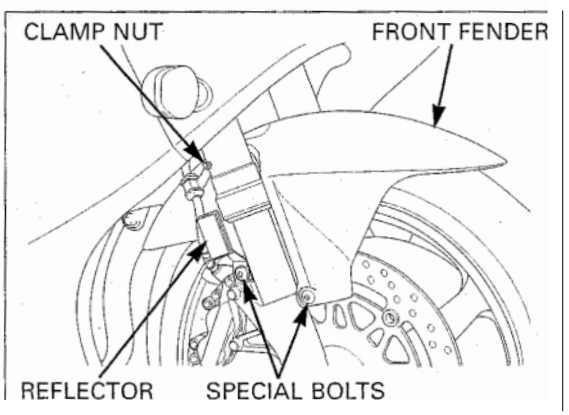


FRQNT WHEEL

REMOVAL

Support the motorcycle securely and raise the front wheel off the ground using a safety stand or a hoist.

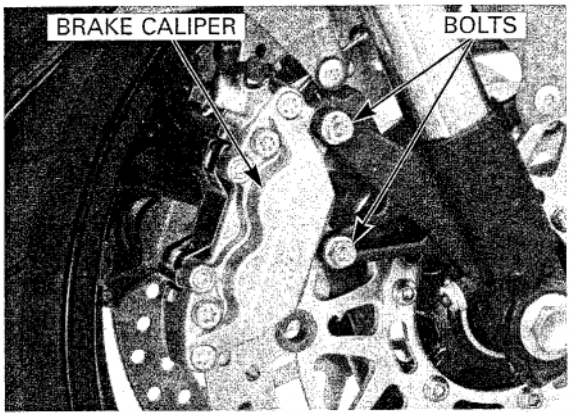
Remove the brake hose clamp nuts, special bolts and front fender (page 2-8).



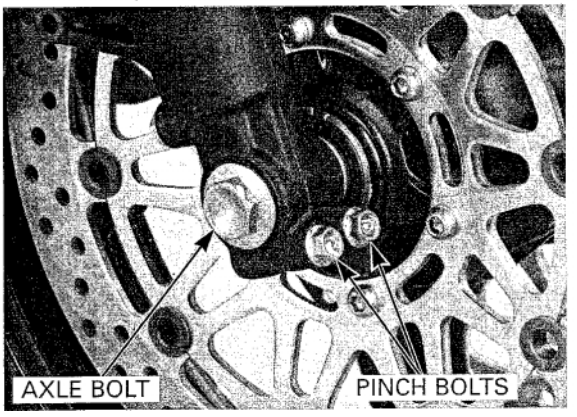
Do not operate the brake lever after the brake caliper is removed

Remove the mounting bolts and both brake calipers.

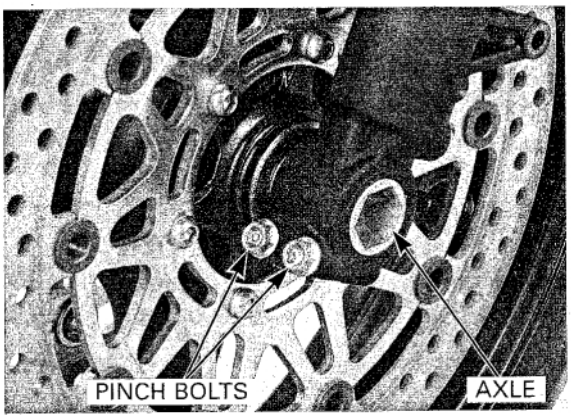
Support the brake caliper with a piece of wire so it does not hang from the brake hose. Do not twist the brake hose



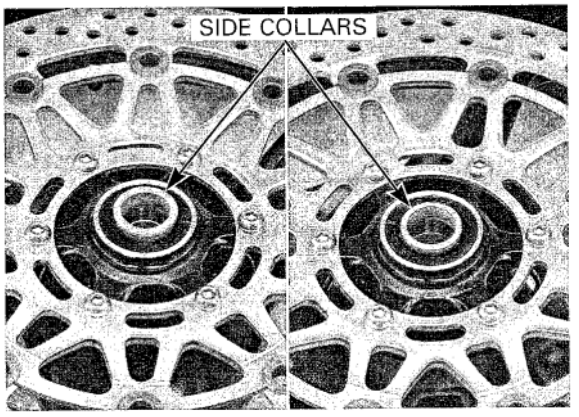
Loosen the right axle pinch bolts.
Remove the axle bolt.



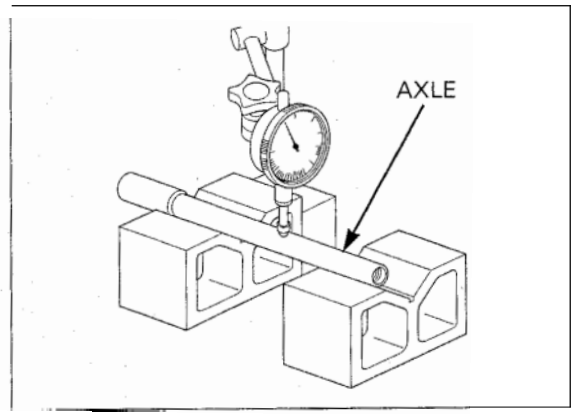
Loosen the left axle pinch bolts.
Remove the axle and the front wheel.



Remove the side collars.



INSPECTION



Axle

Set the axle in V-block and measure the runout, Actual runout is 1/2 the total indicator reading.

SERVICE LIMIT: 0.20 mm (0.008 in)

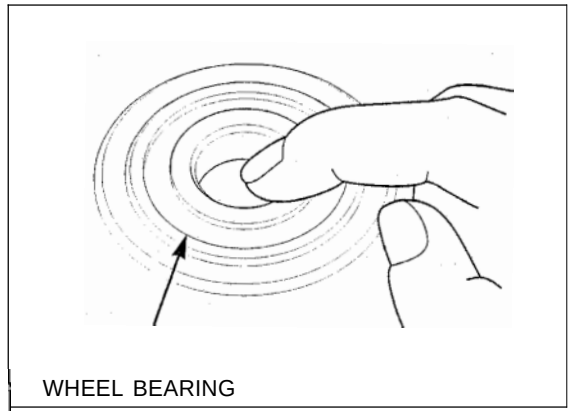
Wheel bearing

Turn the inner race of each bearing with your finger. The bearings should turn smoothly and quietly. Also check that the bearing outer race fits tightly in the hub.

Replace the bearings in pairs.

Remove and discard the bearings if they do not turn smoothly, quietly, or if they fit loosely in the hub.

Install the new bearings into the hub using the special tools (page 13-12).

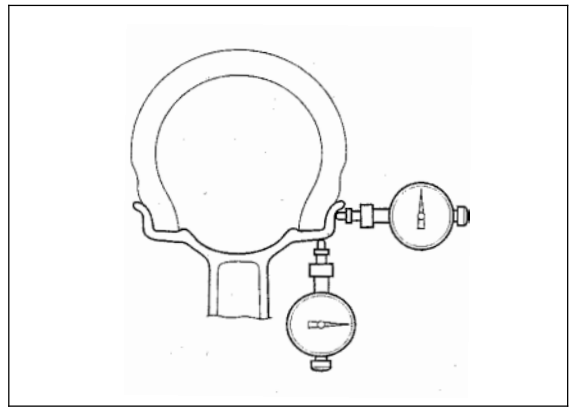


WHEEL BEARING

Wheel rim runout

Check the rim runout by placing the wheel in a trueing stand.
Spin the wheel by hand, and read the runout using a dial indicator.
Actual runout is 1/2 the total indicator reading.

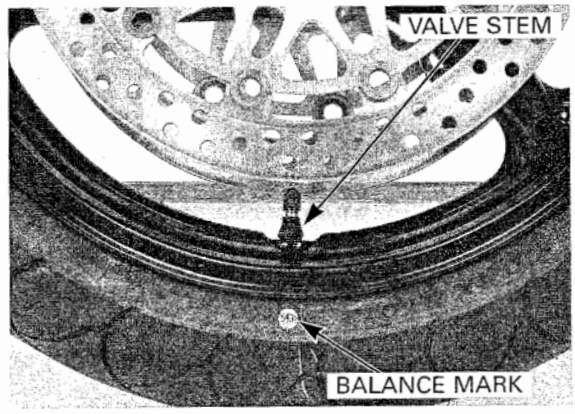
SERVICE LIMITS:
Radial: 2.0 **mm (0.08 in)**
Axial: 2.0 mm (0.08 in)



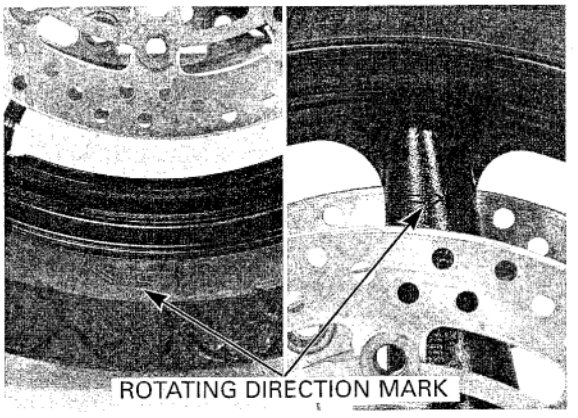
For optimum baiance, the tire balance mark (a paint dot on the side wall) must be iocated next to the valve stem Remount the tire if necessary

Wheel balance

Wheel balance directly affects the stability, handling and overall safety of the motorcycle. Always check balance when the tire has been removed from the rim.

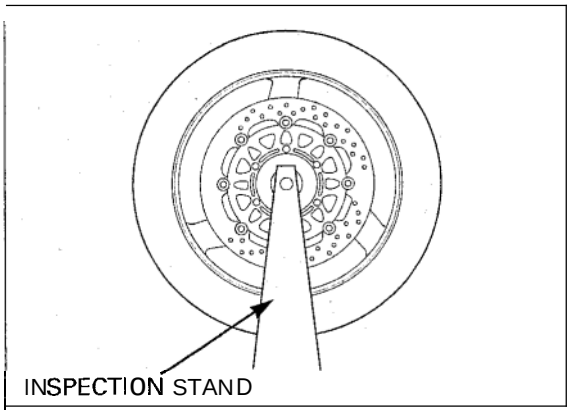


Note the direction of rotation marks on the wheel and tire.



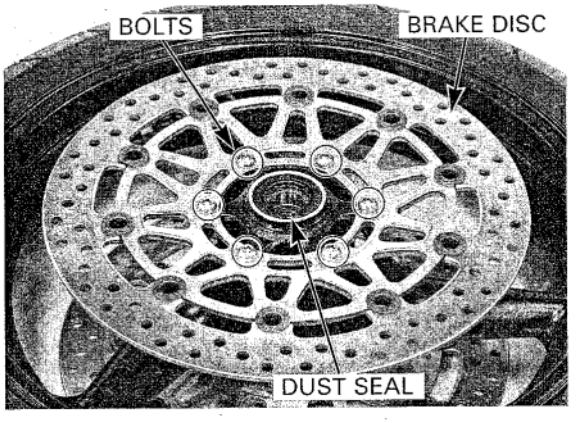
Remove the dust seals from the wheel.
Mount the wheel, tire and brake discs assembly in an inspection stand.
Spin the wheel, allow it to stop, and mark the lowest (heaviest) point of the wheel with chalk.
Do this two or three times to verify the heaviest area. If the wheel is balanced, it will not stop consistently in the same position.

To balance the wheel, install wheel weights on the highest side of the rim, the side opposite the chalk marks. Add just enough weight so the wheel will no longer stop in the same position when it is spun. Do not add more than 60 grams to the wheel.



DISASSEMBLY

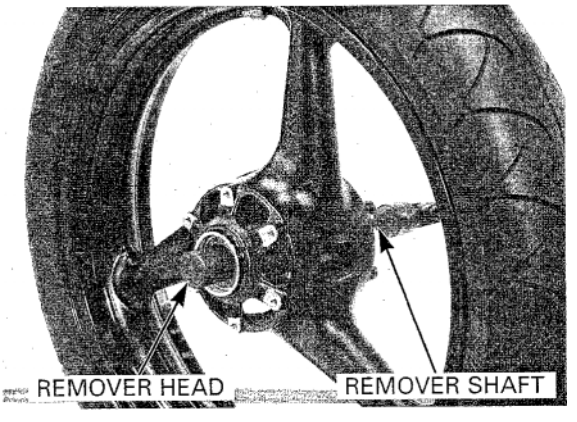
Remove the bolts and brake discs.
Remove the dust seals.



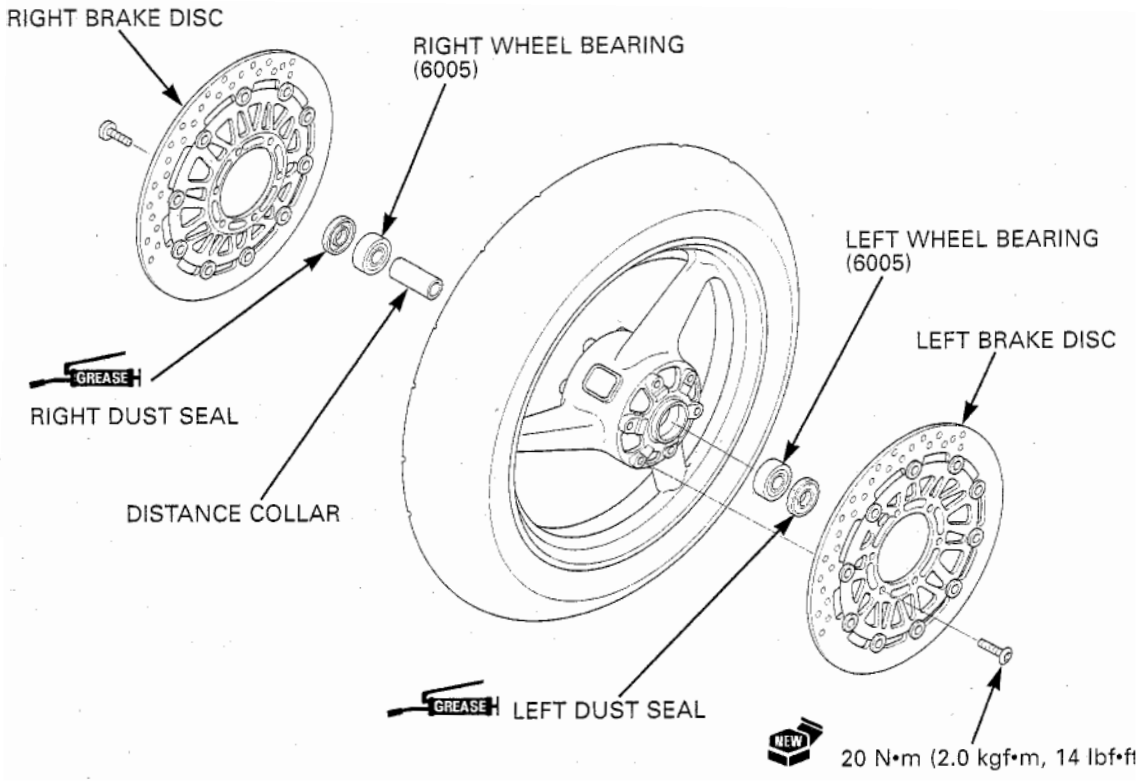
Install the bearing remover head into the bearing.
From the opposite side, install the bearing remover shaft and drive the bearing out of the wheel hub.
Remove the distance collar and drive out the other bearing.

TOOLS:

Bearing remover head, 25 mm	**07746-0050800**
Bearing remover shaft	**07746-0050100**



ASSEMBLY

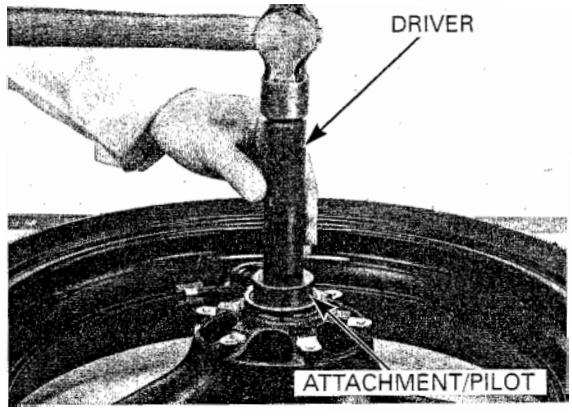


Never install the oid bearings Once the bearings have been removed, the beanngs must be replaced with new ones

Drive in a new right bearing squarely.
Install the distance collar, then drive in the left bearing using the special tool.

TOOLS:

Driver	**07749-0010000**
Attachment, 42 x 47 mm	**07746-0010300**
Pilot, 25 mm	**07746-0040600**

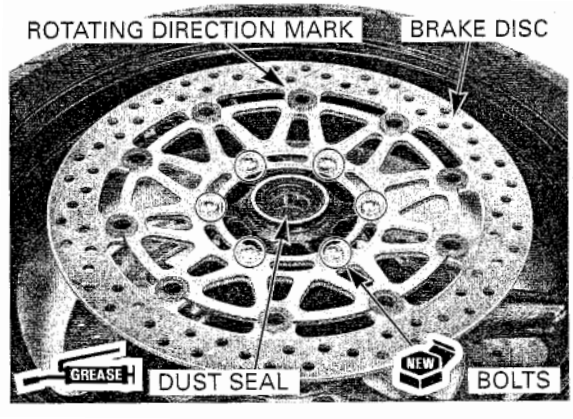


Do not get grease on the brake discs or stopping power will be reduced.

Install the brake discs on the wheel hub.
Install and tighten the new mounting bolts to the specified torque.

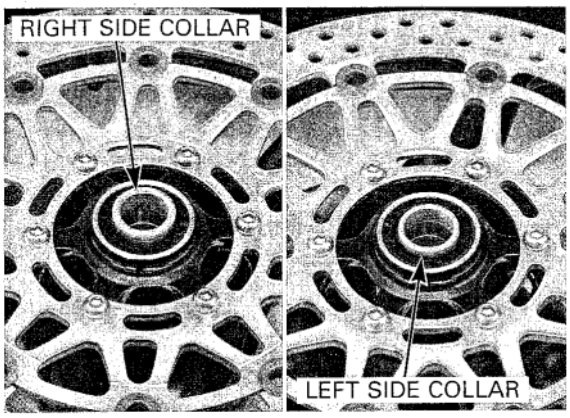
TORQUE: 20 N•m (2.0 kgf•m, 14 lbf•ft)

Apply grease to the dust seal lips, then install them into the wheel hub.



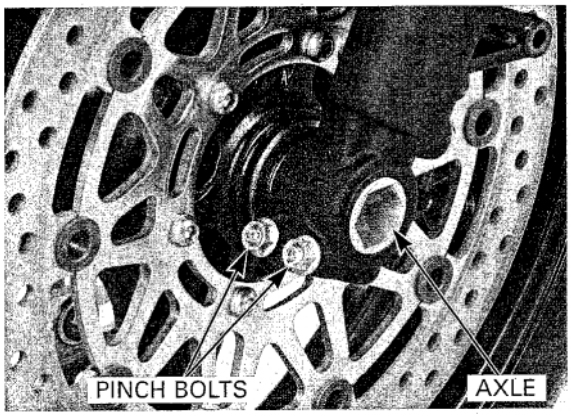
INSTALLATION

Install the right and left side collars.



Install the front wheel between the fork legs.

Apply a thin layer of grease to the front axle surface.
Install the front axle from the left side.

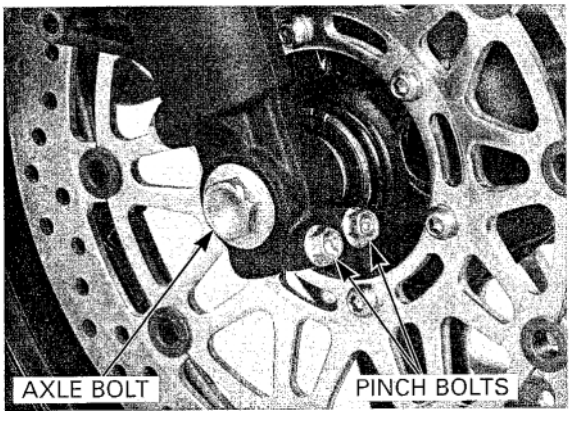


Hold the axle and tighten the axle bolt to the specified torque.

TORQUE: 78 N·m (8.0 kgf·m, 58 lbf·ft)

Tighten the right axle pinch bolts to the specified torque.

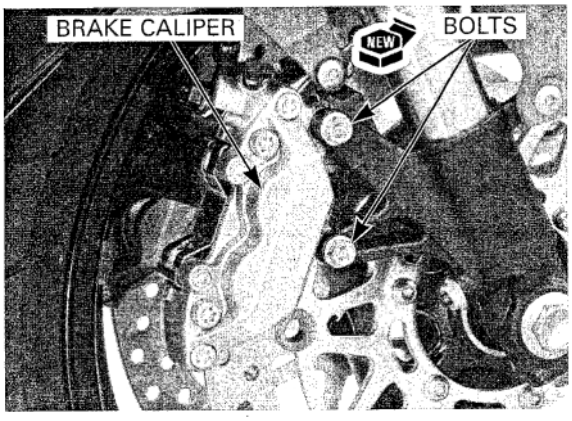
TORQUE: 22 N·m (2.2 **kgf-m, 16 lbf·ft)**



Install the both brake caliper and tighten the new mounting bolts to the specified torque.

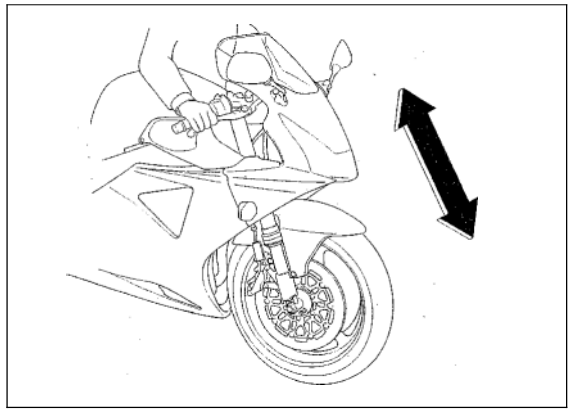
TORQUE: 30 N·m (3.1 kgf-m 22 lbf·ft)

Install the front fender (page 2-8).



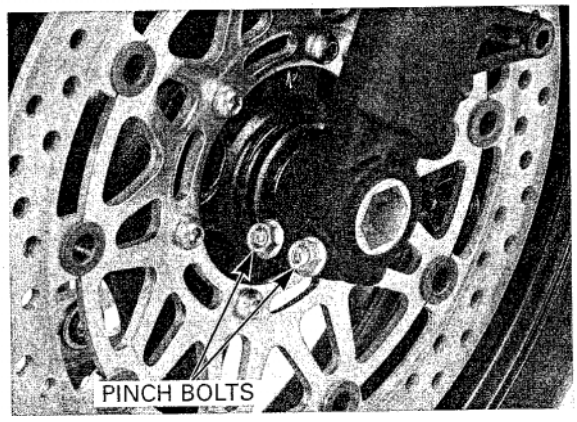
With the front brake applied, pump the fork up and down several times to seat the axle and check brake operation.

Check the brake operation by applying the brake lever.

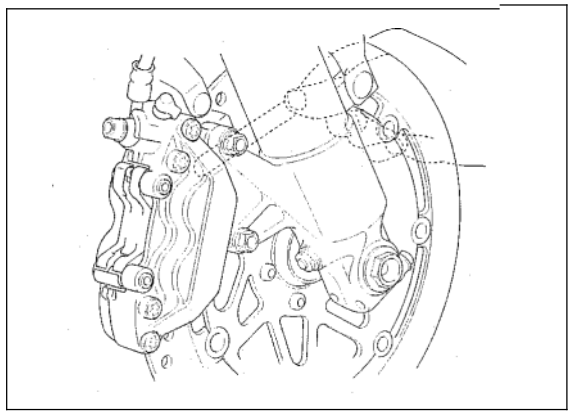


Tighten the left axle pinch bolts to the specified torque.

TORQUE: 22 N·m (2.2 kgf·m, 16 lbf·ft)



Check the clearance between the brake disc and caliper bracket on each side after installation.
The clearance should be at least 0.7 mm (0.03 in).



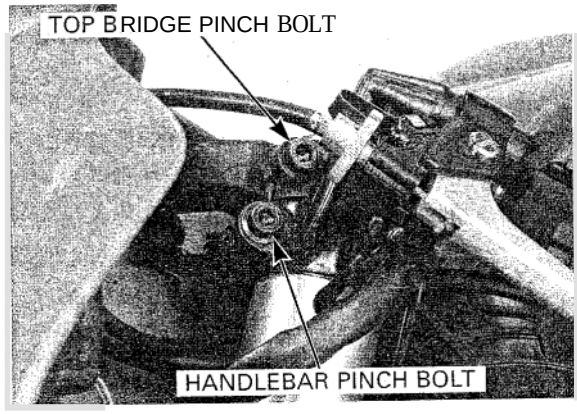
FORK

Keep the brake master cylinder upright

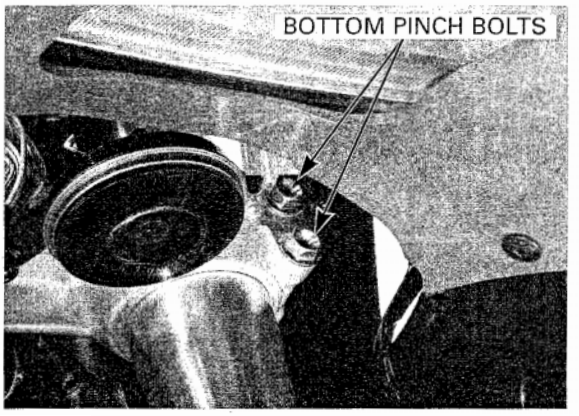
REMOVAL

Remove the front wheel (page 13-9).

Loosen the handlebar pinch bolt and top bridge pinch bolt.
When the fork leg will be disassembled, loosen the fork bolt, but do not remove it yet.



Loosen the fork bottom pinch bolts and remove the fork slider from the fork top bridge and steering stem.

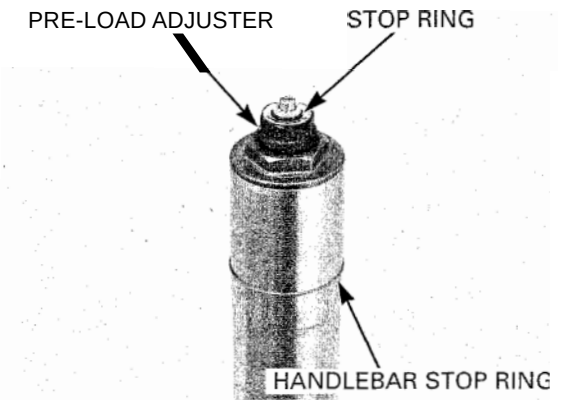


Be careful not to scratch the fork pipe or damage the dust seal

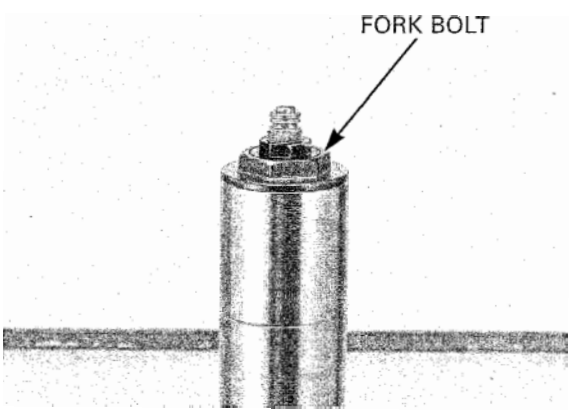
DISASSEMBLY

Remove the handlebar stop ring.

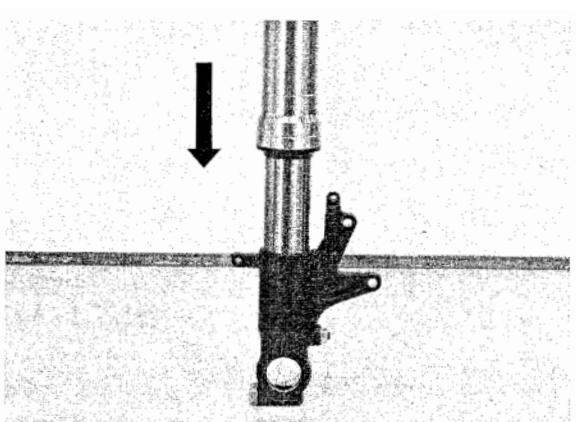
Remove the stopper ring and pre-load adjuster.



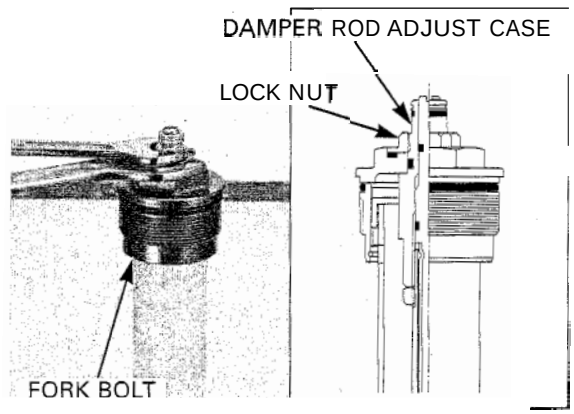
Remove the fork bolt from the fork slider.



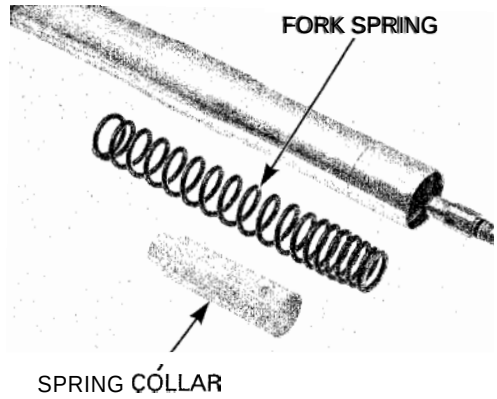
Push the fork slider slowly down, and gentry seat the dust seal onto the axle holder.



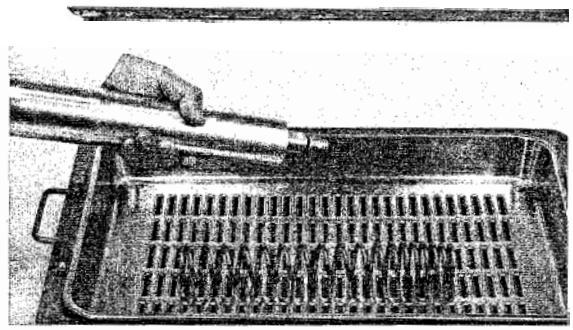
Hold the damper rod adjuster case, then loosen the lock nut.
Remove the lock nut and fork bolt from the damper rod.



Remove the following:
- Spring collar
- Fork spring



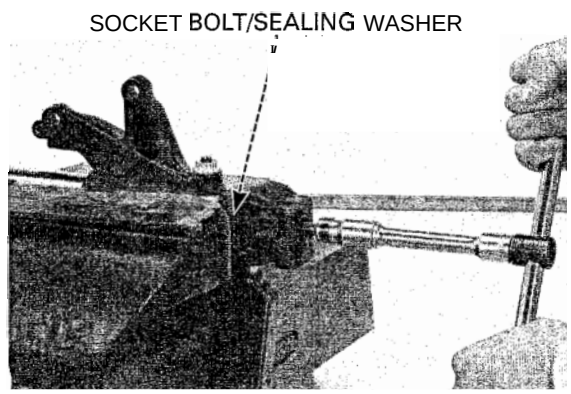
Pour out the fork fluid by pumping the fork pipe several times.
Pour out the fork fluid from the fork damper by pumping the damper rod several times.



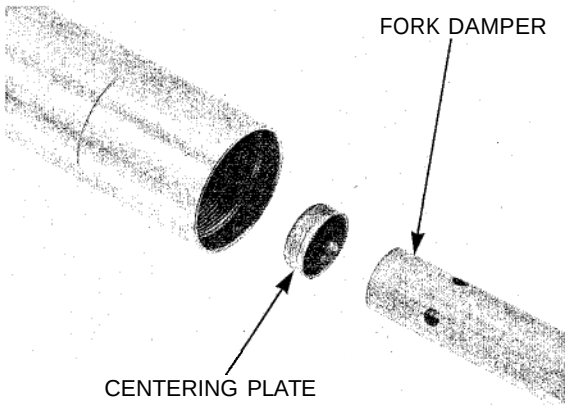
Hold the axle holder in a vice with soft jaws or a shop towel.
Hold the fork damper with the fork damper holder, then remove the fork socket bolt and sealing washer.

TOOLS:

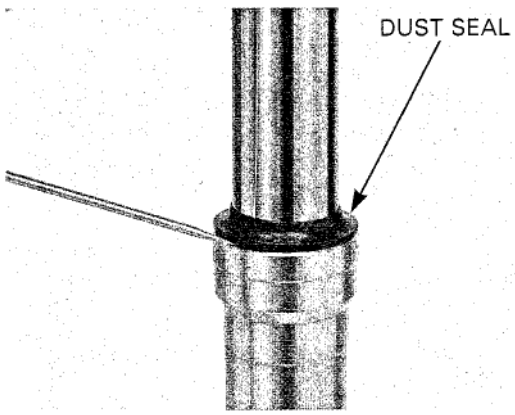
Fork damper holder	**07YMB-MCF0101**
Fork damper holder handle	**07TMB-001010A**



Remove the fork damper assembly and centering plate from the fork pipe.

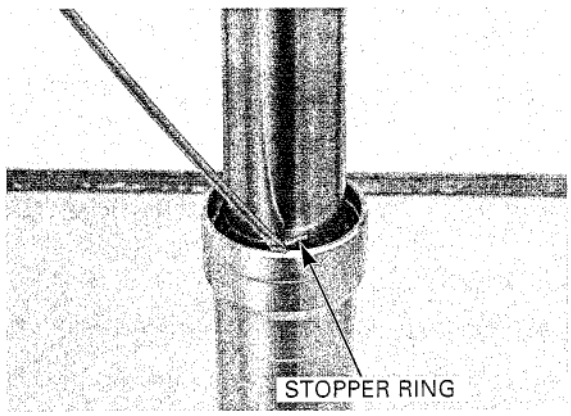


Remove the dust seal.

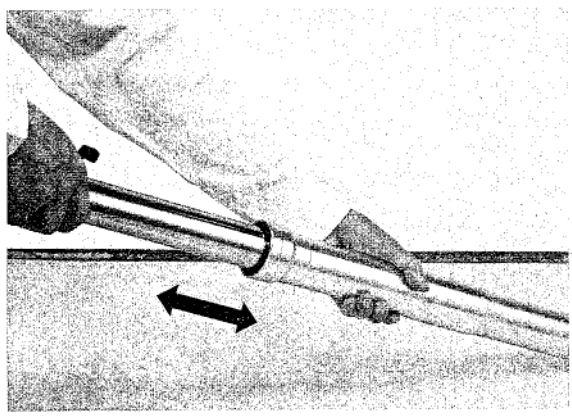


Do nor scratch ihe fork pipe sliding surface

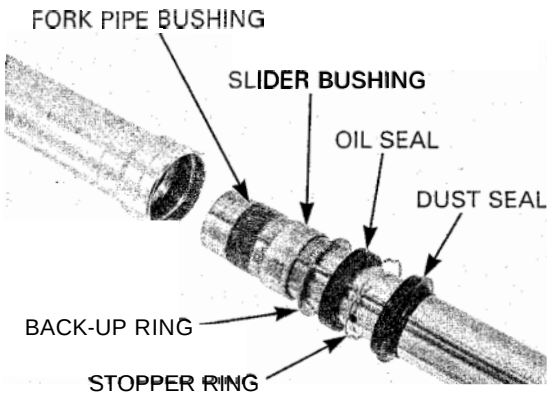
Remove the oil seal stopper ring.



Pull the fork slider out until you feel resistance from the slider bushing. Then move it in and out, tapping the bushing lightly until the fork pipe separates from the fork slider.
The slider bushing will be forced out by the fork pipe bushing.



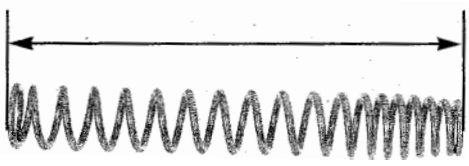
Remove the fork pipe bushing, slider bushing, back-up ring, oil seal, stopper ring and dust seal from the fork pipe.



INSPECTION

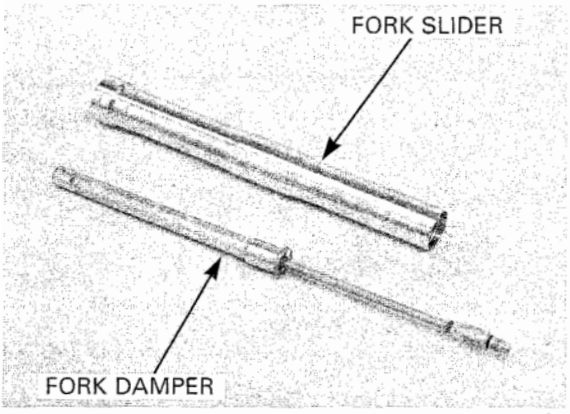
Fork spring
Measure the fork spring free length.

SERVICE LIMIT: *250.8* mm **(9.87in)**



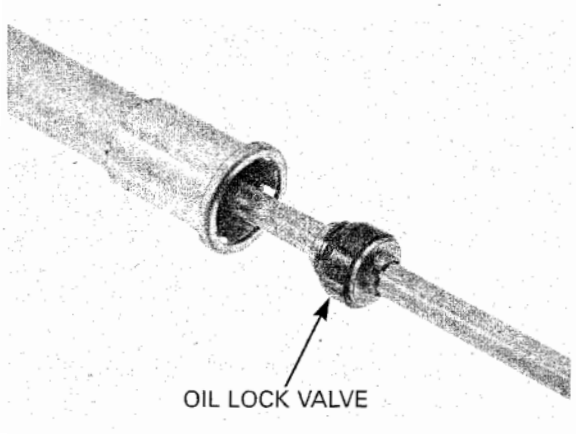
Fork pipe/slider/damper
Check the fork pipe and fork slider for score marks, scratches, or excessive or abnormal wear.
Replace any components which are worn or damaged.

Check the fork damper for damage.



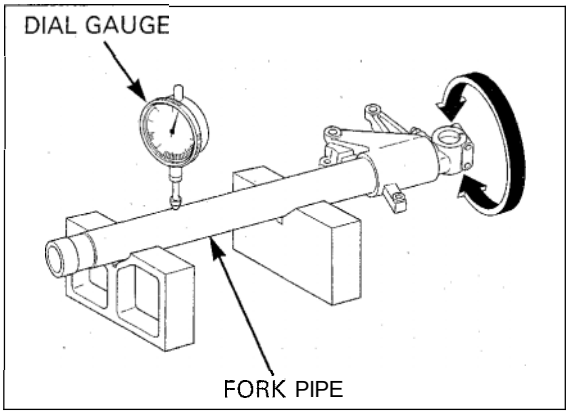
Check the oil lock valve for wear or damage.

Replace the fork damper assembly, if any components are damaged.



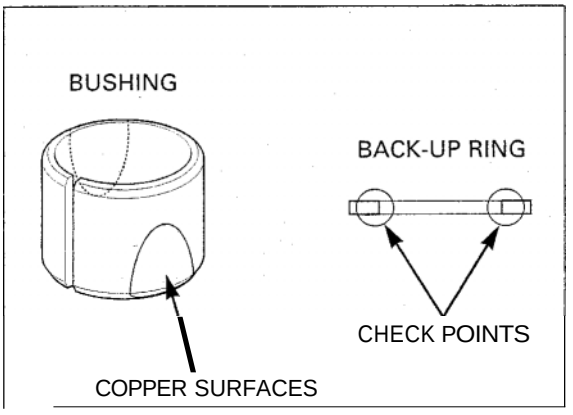
Place the fork pipe in V-blocks and measure the runout.
Actual runout is 1/2 the total indicator reading.

SERVICE LIMIT: 0.20 mm (0.008 in)

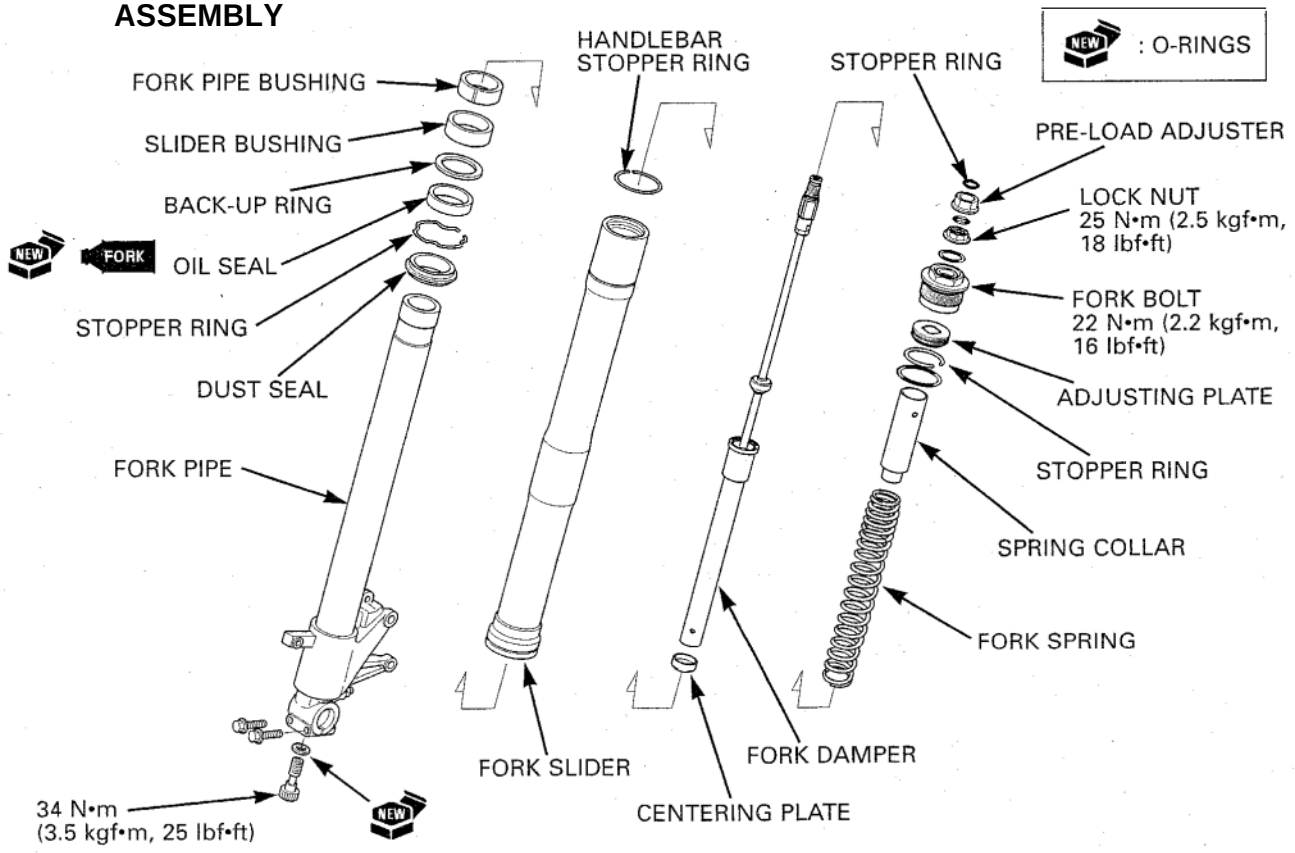


Fork pipe bushing
Visually inspect the slider and fork pipe bushings. Replace the bushings if there is excessive scoring or scratching, or if the teflon is worn so that the copper surface appears on more than 3/4 of the entire surface.

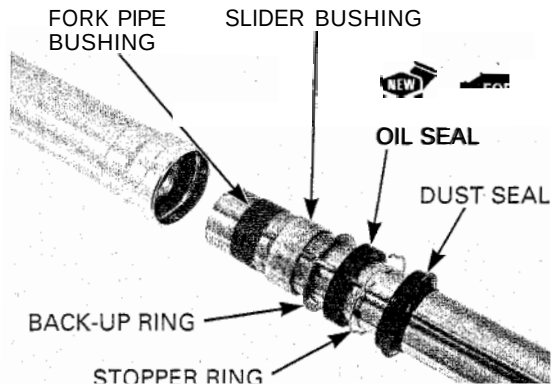
Check the back-up ring; replace it if there is any distortion at the points shown.



ASSEMBLY



Before assembly, wash all parts with a high flash-point or non-flammable solvent and wipe them dry.



Install the oil seal with its marked side facing up.

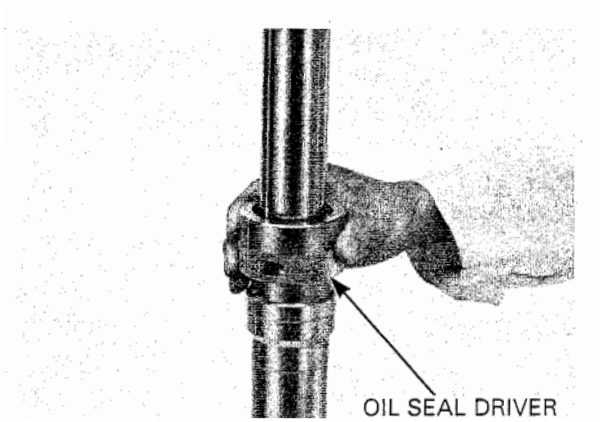
Install the dust seal, stopper ring, new oil seal, back-up ring, and slider bushing.
Install a new fork pipe bushing.

Apply fork fluid to the oil seal lips.
Install the fork pipe into the fork slider.

Drive the oil seal in using the special tools.

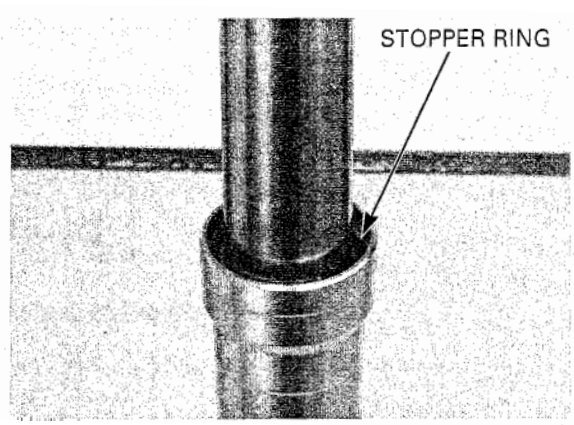
TOOL:

Oil **seal driver**	**07YMD–MCF0100 or 07NMD–KZ301OA (U.S.A. only)**

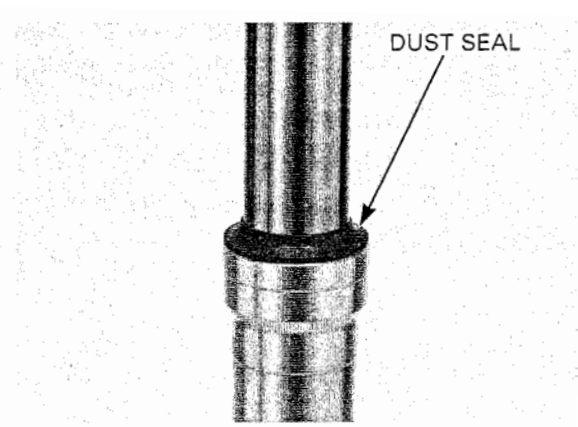


Do not scratch rhe fork pipe sliding surface.

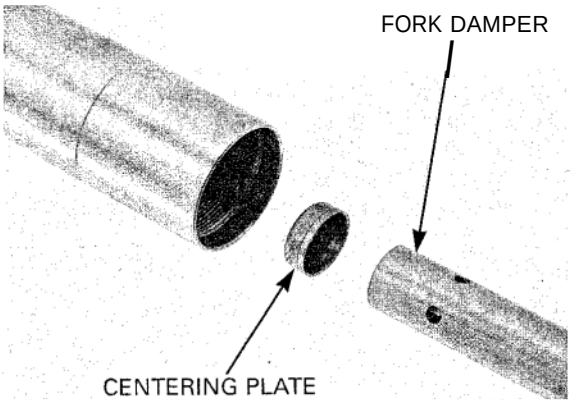
Install the stopper ring into the fork slider groove securely.



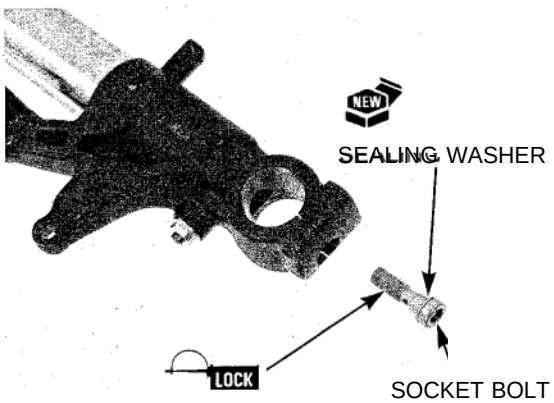
Install the dust seal.



Install the centering plate onto the end of the fork damper.
Install the fork damper assembly into the fork pipe.



Apply a locking agent to the fork socket bolt threads.
Install the socket bolt with a new sealing washer.

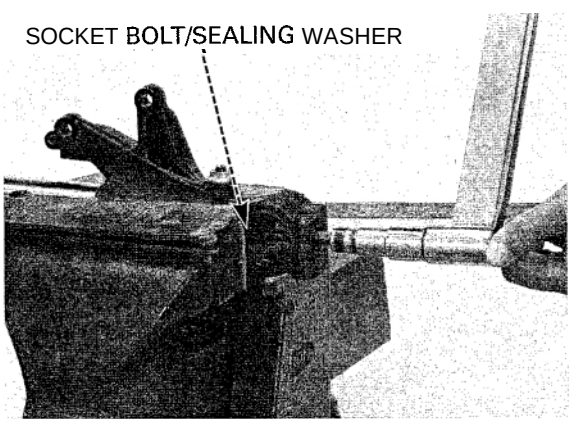


Hold the axle holder in a vise with soft jaws or a shop towel.
Hold the fork damper with the fork damper holder, then tighten the fork socket bolt to the specified torque.

TOOLS:

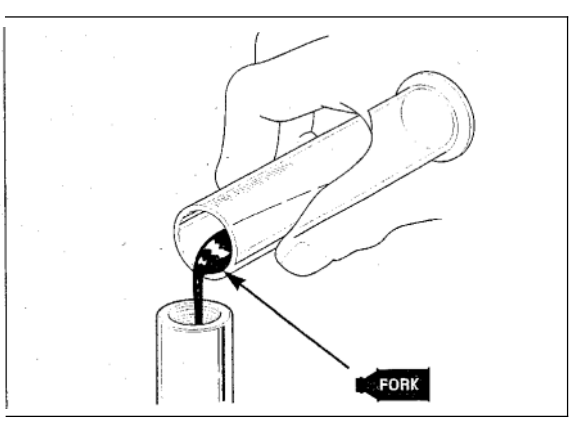
Fork damper holder	**07YMB–MCF0101**
Fork damper holder handle	**07TMB-001010A**

TORQUE: 34 N•m (3.5 kgf•m, 25 lbf•ft)



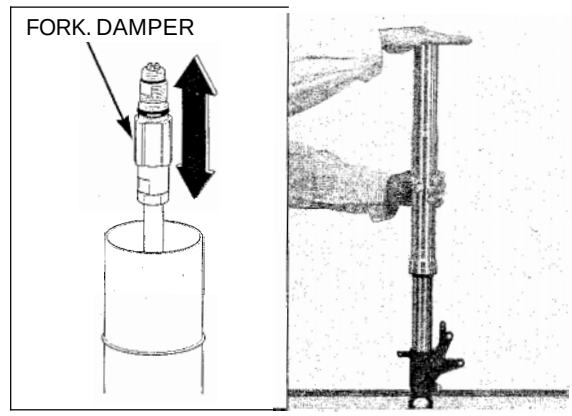
Pour the specified amount of the recommended fork fluid into the fork pipe.

RECOMMENDED FORK FLUID:
Pro Honda Suspension Fluid SS-8
FORK FLUID CAPACITY:
513 ± 2.5 cm³ (17.3 ± 0.08 US oz, 18.1 ± 0.09 Imp oz)



Bleed the air as follows:

1. Extend the fork.
2. Cover the top of the fork slider with your hand and compress the fork slowly.
3. Pump the fork pipe and fork damper slowly 8 – 10 times.

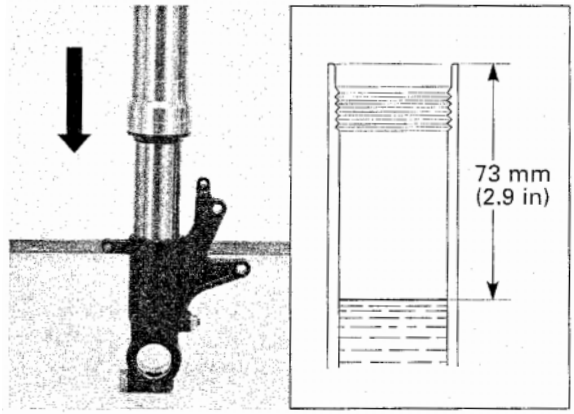


Slowly push down the fork slider, and gently seat the dust seal onto the axle holder and leave it for 5 minutes.

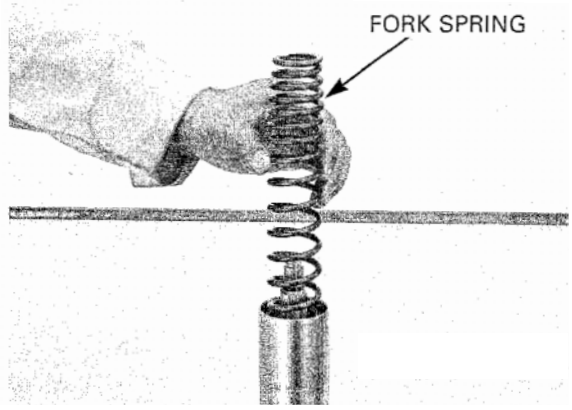
Be sure the oil level is the same in both forks

After the oil level stabilizes, measure the oil level from the top of the fork slider.

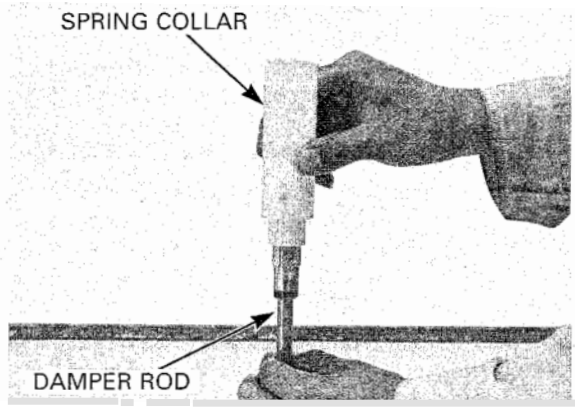
FORK OIL LEVEL: 73 mm (2.9 in)



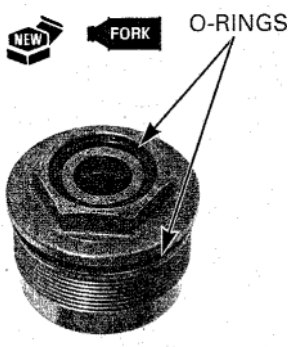
Install the fork spring into the fork slider with the tapered end facing up.



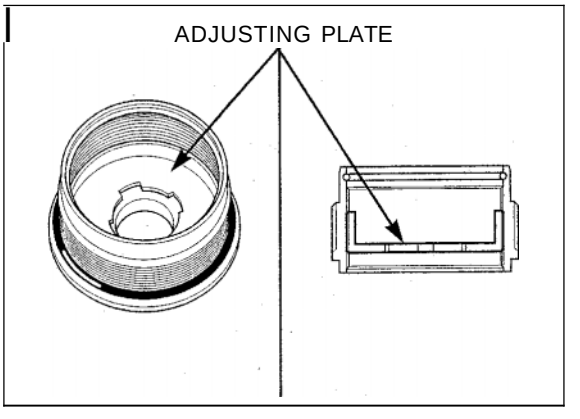
Pull the damper rod up and install the spring collar.



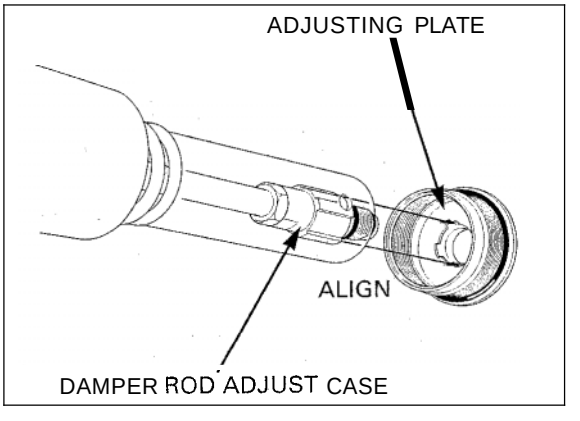
Apply fork fluid to the new O-rings and install them onto the fork bolt.



Turn the adjusting plate clockwise until it seats lightly.



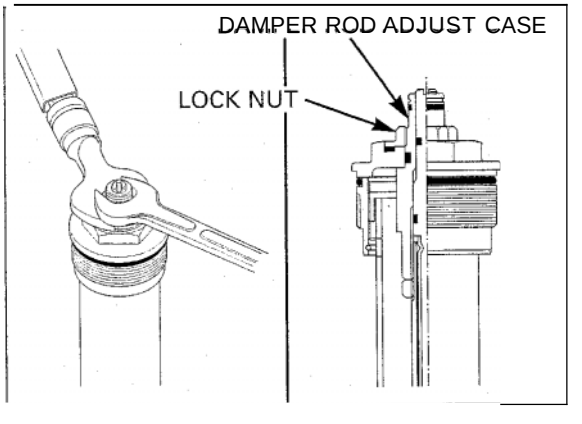
Push down the spring collar, then install the fork bolt to the damper rod adjust case while aligning the groove of the adjusting plate with the damper rod adjust case.



Install the lock nut to the damper rod adjust ca e.

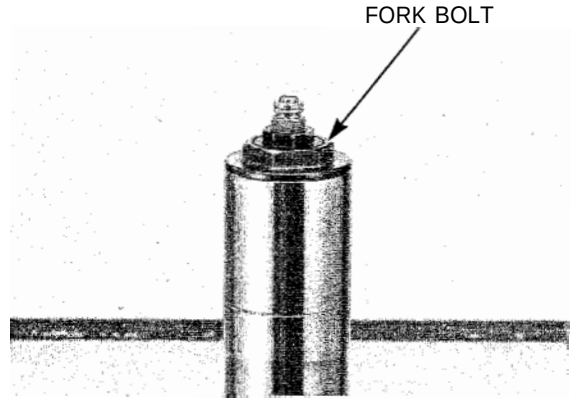
Hold the damper rod adjuster case, and then tighten the lock nut to the specified torque.

TORQUE: 25 N•m (2.6 kgf•m, 19 lbf•ft)

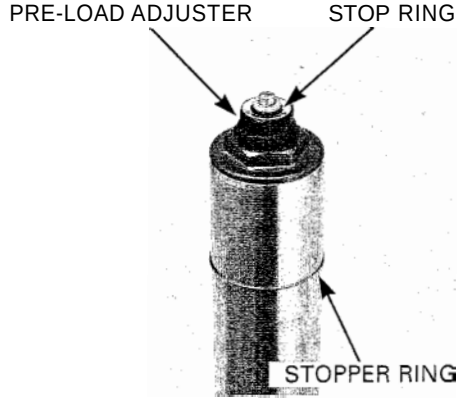


Tighten the fork bolt after installing the fork slider into the fork bridges

Install the fork bolt to the fork slider.

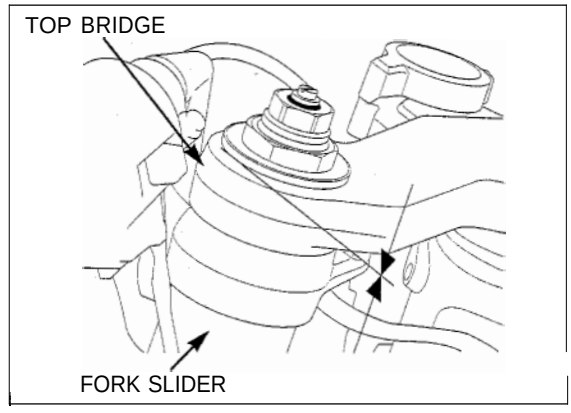


Install the handlebar stopper ring.
Install the pre-load adjuster and stop ring.



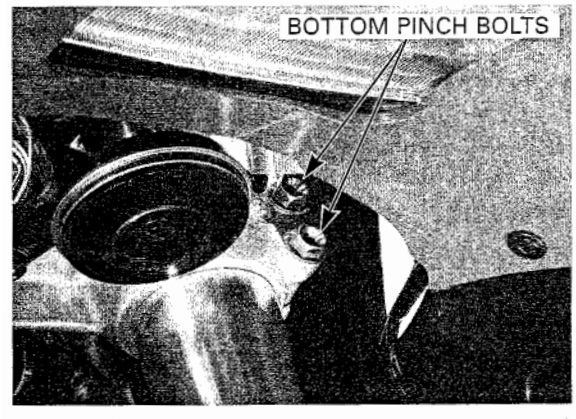
INSTALLATION

Install the fork leg through the bottom bridge, handlebar and top bridge (page 13-6).
Position the top end of the fork pipe flush with the upper surface of the top bridge as shown.



Tighten the bottom bridge pinch bolts to the specified torque.

TORQUE: 26 N•m (2.7 kgf•m, 20 lbf•ft)



If the fork bolt was loosened, tighten it to the specified torque.

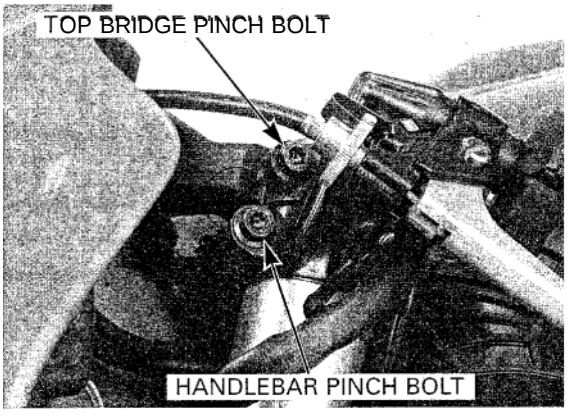
TORQUE: 22 N·m (2.2 kgf·m, 16 lbf·ft)

Tighten the handlebar pinch bolt to the specified torque.

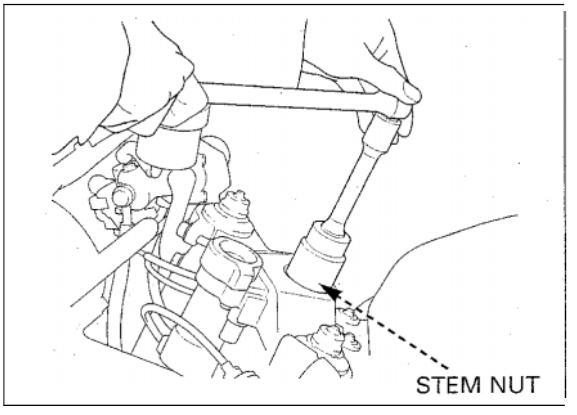
TORQUE: 26 N·m (2.7 kgf·m, 20 lbf·ft)

Tighten the top bridge pinch bolt to the specified torque.

TORQUE: 23 N·m (2.3 kgf·m, 17 lbf·ft)



Install the front wheel (page 13-14).
Adjust the pre-load and rebound/damping adjuster (page 3-28, 29).



STEERING STEM

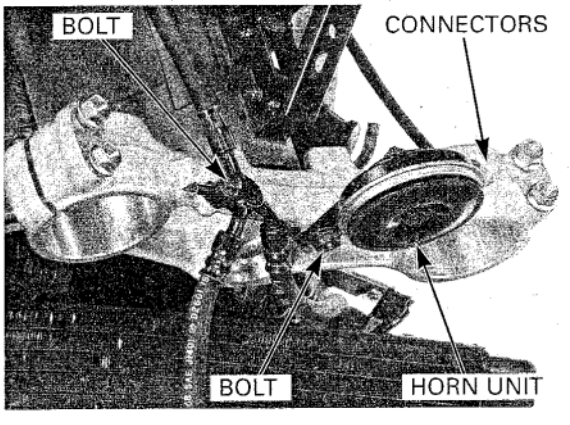
REMOVAL

Remove the following:
- Front wheel (page 13-9)
- Upper cowl (page 2-5)

Remove the steering stem nut.

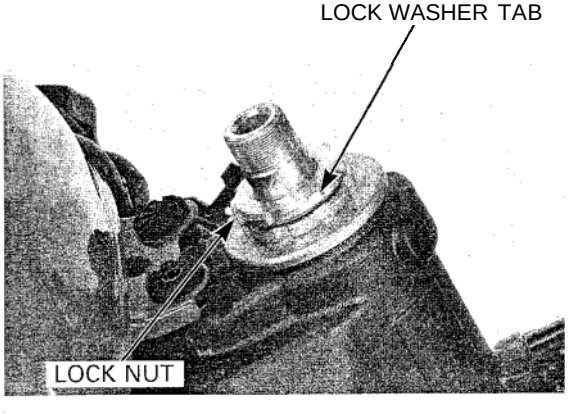
Remove the following:
- Handlebars (page 13-4)
- Fork legs (page 13-15)

Disconnect the horn connectors.
Remove the bolt and horn unit.
Remove the bolt and brake hose joint.



Straighten the tabs of the lock washer.

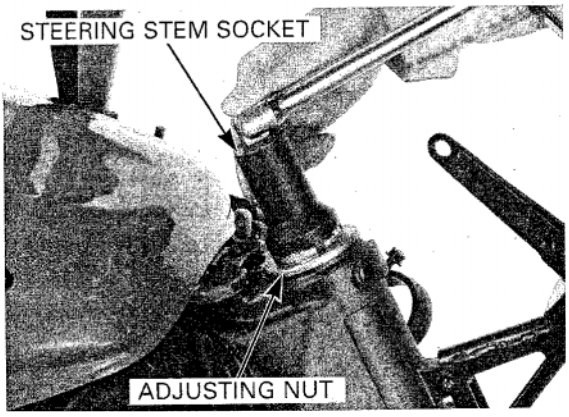
Remove the lock nut and lock washer.



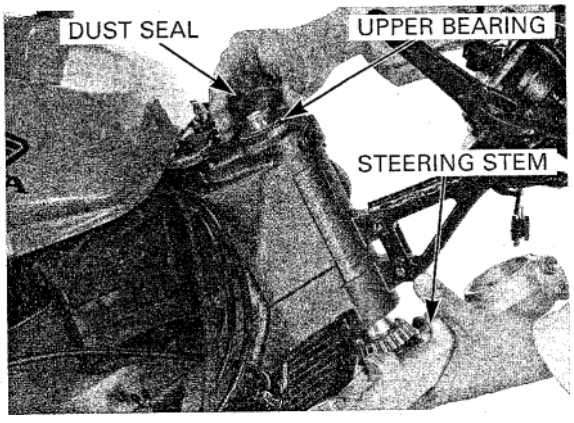
Remove the steering stem adjusting nut using the special tool.

TOOL:

Steering stem socket	**07916–3710101 or 07916–3710100 (U.S.A. only)**



Remove the following:
- Dust seal
- Upper bearing
- Steering stem



Always replace the bearings and races as a set

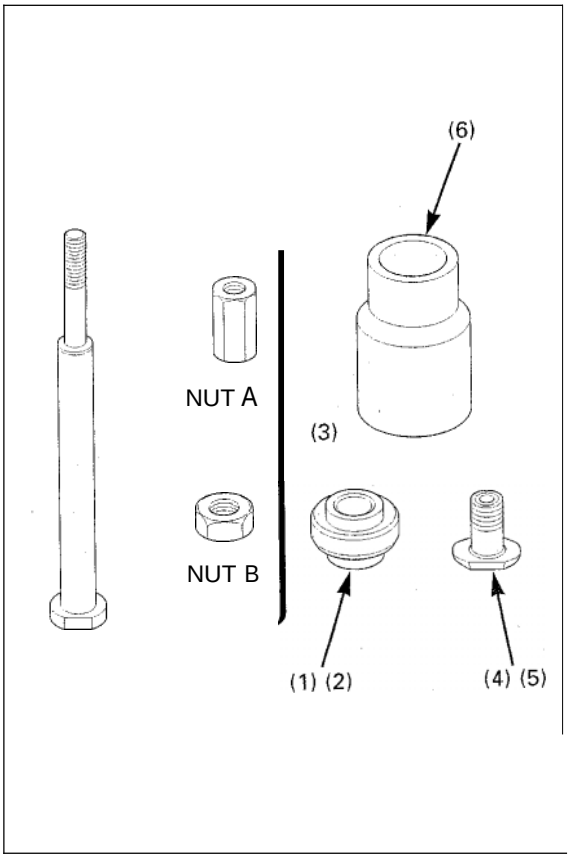
OUTER RACE REPLACEMENT

Replace the races using the special tools as described in the following procedure.

For U.S.A only outer race repiacement, refer to page 13-30

TOOLS:

Driver attachment, A (1)	**07946–KM90100**
Driver attachment, B (2)	**07NMF–MT70120**
Driver shaft assembly (3)	**07946–KM90300**
Bearing remover, A (4)	**07946–KM90401**
Bearing remover, B (5)	**07NMF–MT70110**
Assembly base (6)	**07946–KM90600**

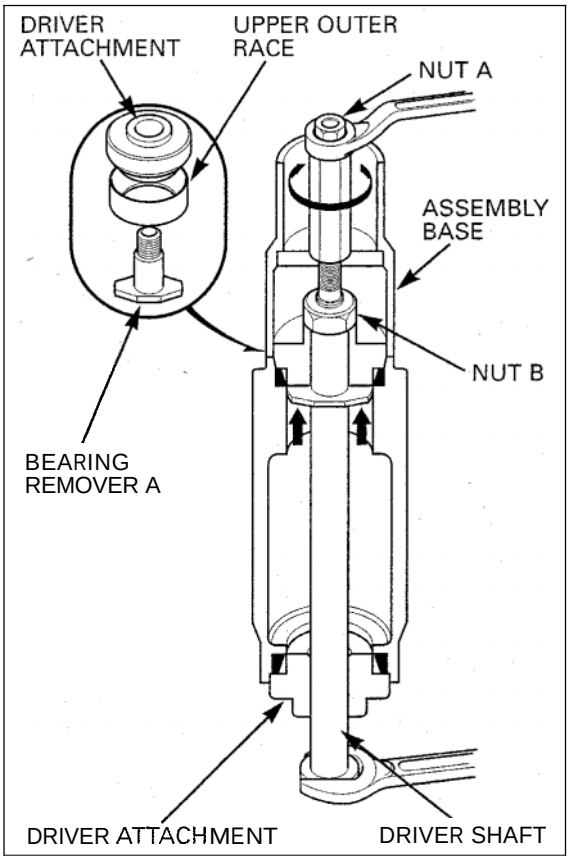


Install the ball race remover into the head pipe as shown.

Align bearing remover A with the groove in the steering head.
Lightly tighten nut B with a wrench.

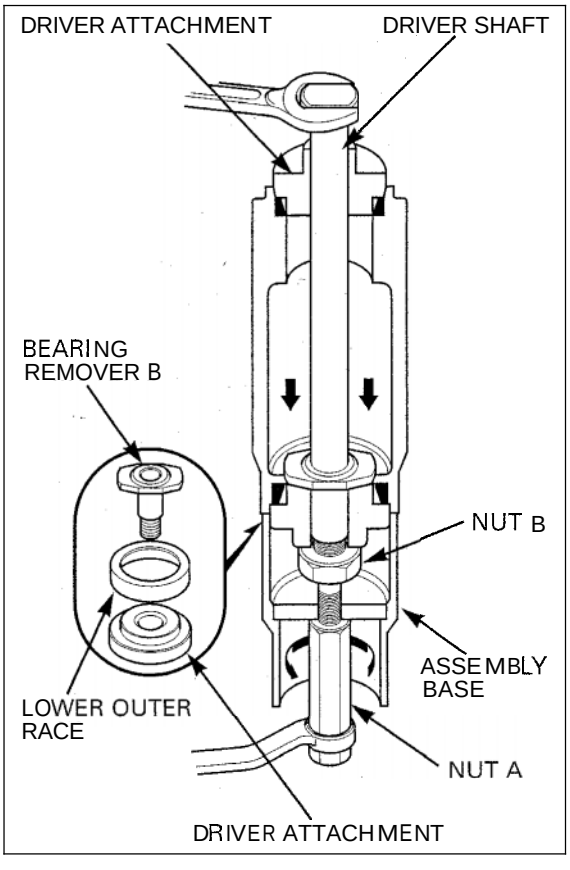
Note the installation direction of the assembly base.

Holding the driver shaft with a wrench, turn nut A gradually to remove the upper outer race.

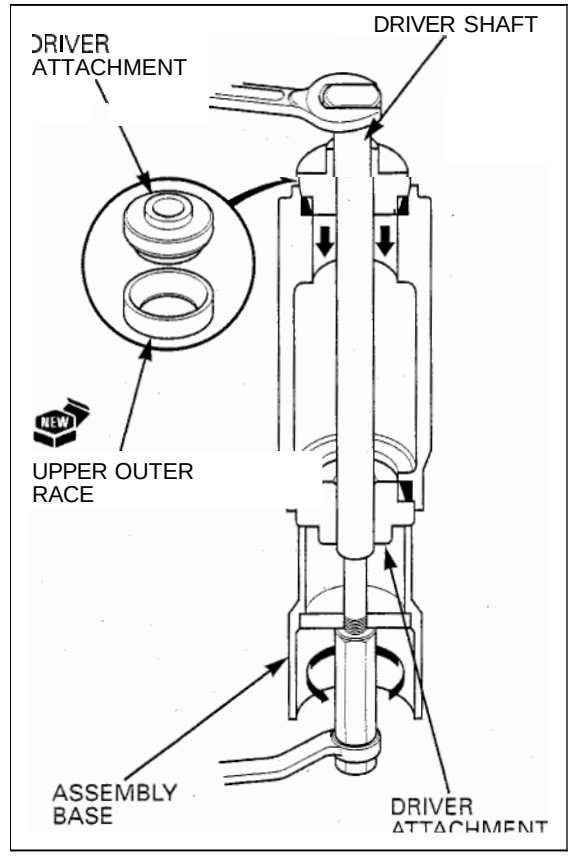


Install ball race remover B as shown and remove the lower outer race using the same procedure as for the upper outer race.

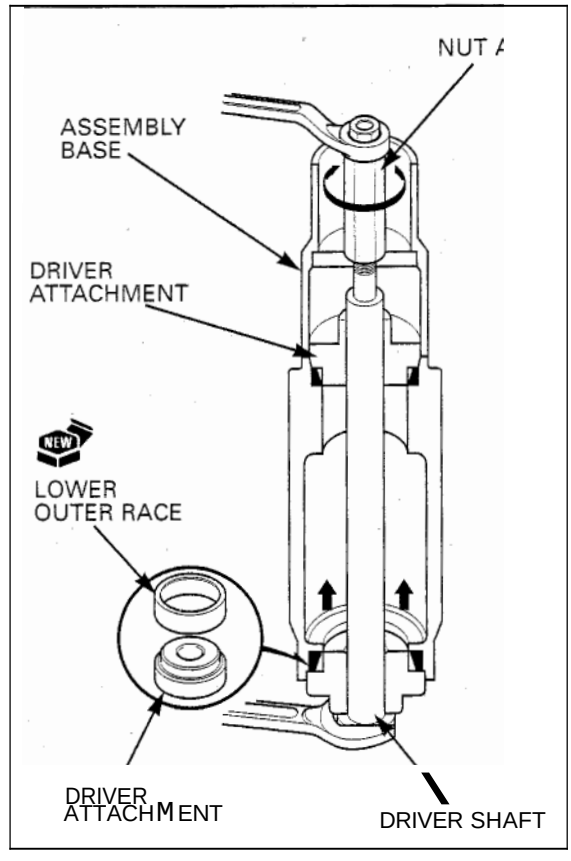
Align the bearing remover with the groove in the steering head.



Install a new upper outer race and the ball race remover as shown.
Hold the driver shaft with a wrench and turn nut A gradually until the groove in driver attachment A aligns with the upper end of the steering head. This will allow you to install the upper outer race.



Install a new lower outer race and ball race remover as shown.
Holding the driver shaft with a wrench, turn nut A gradually until the groove in driver attachment **B** aligns with the upper end of the steering head. This will allow you to install the lower outer race.

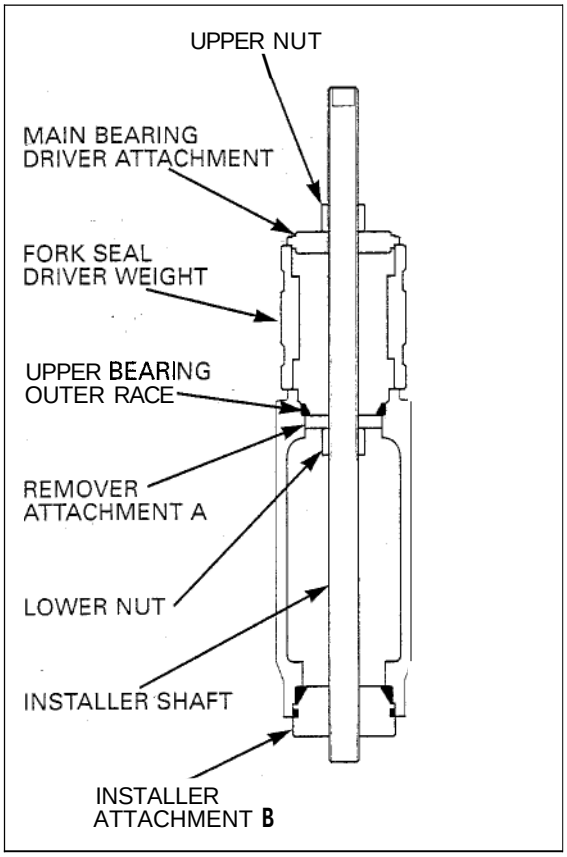


U.S.A. only:
Replace the steering head bearing outer races using the special tools listed below.

TOOLS:

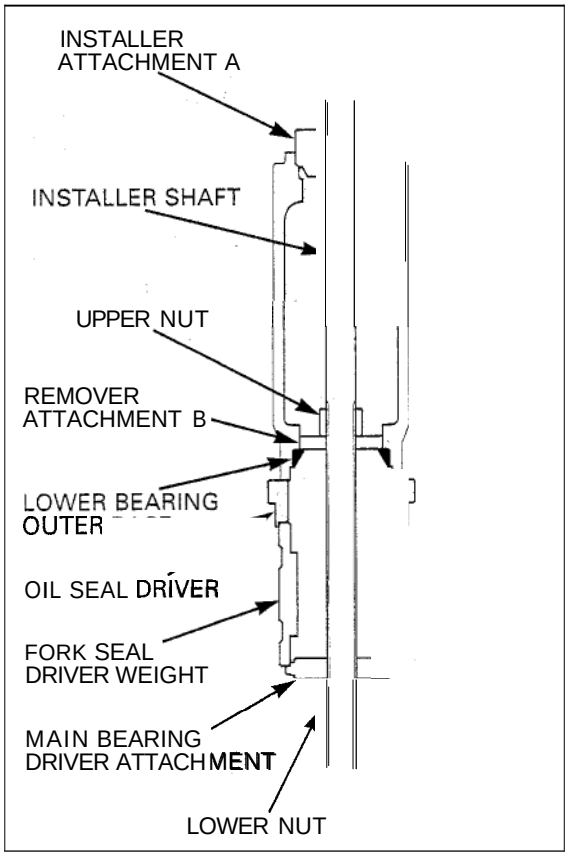
Main bearing driver attachment	**07946–ME90200**
Fork seal driver body	**07947–KA50100**
Oil **seal driver**	**07965–MA60000**
Installer shaft	**07VMF–KZ30200**
Installer attachment A	**07VMF–MAT0100**
Installer attachment B	**07VMF–MAT0200**
Remover attachment A	**07VMF–MAT0300**
Remover attachment B	**07VMF–MAT0400**

Install the special tools into the steering head pipe as shown.
Align remover attachment A with the groove in the steering head.
While holding the installer shaft with the wrench, turn the upper nut gradually to remove the upper bearing outer race.

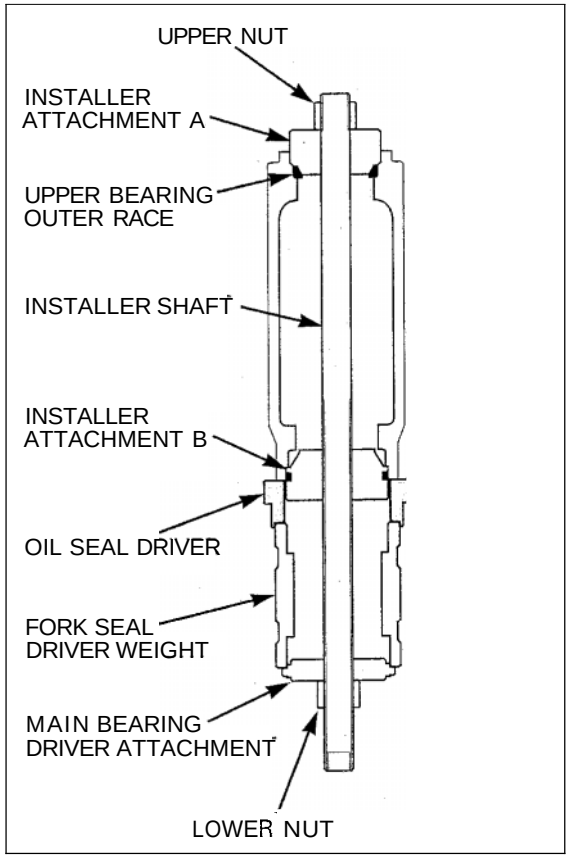


Be careful not to drop the attachments into the frame

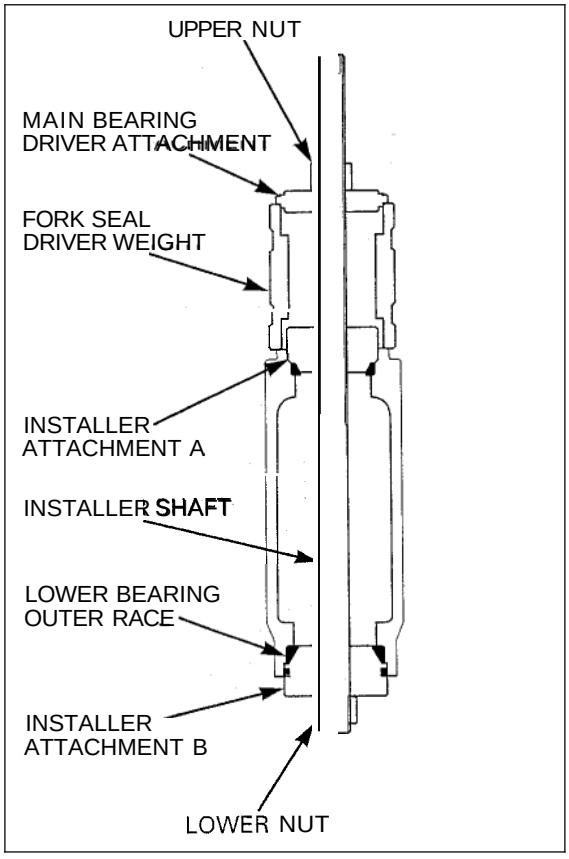
Install the special tools into the steering head pipe as shown.
Align remover attachment B with the groove in the steering head.
While holding the installer shaft with the wrench, turn the lower nut gradually to remove the lower bearing outer race.



Install a new upper bearing outer race and the special tools as shown.
While holding the installer shaft with the wrench, turn the lower nut gradually until the groove in installer attachment A aligns with the upper end of the steering head. This will allow you to install the upper bearing outer race.



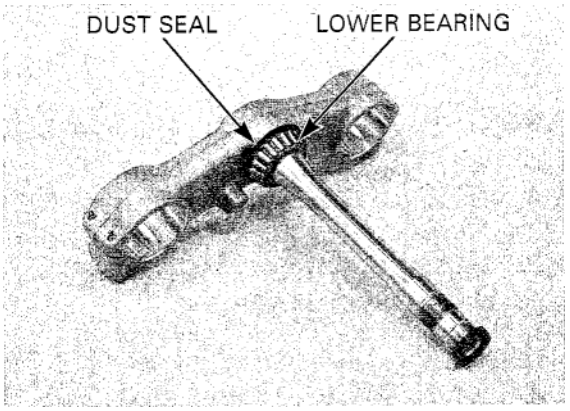
Install a new lower bearing outer race and the special tools as shown.
While holding the installer shaft with the wrench, turn the upper nut gradually until the groove in installer attachment B aligns with the lower end of the steering head. This will allow you to install the lower bearing outer race.



LOWER BEARING REPLACEMENT

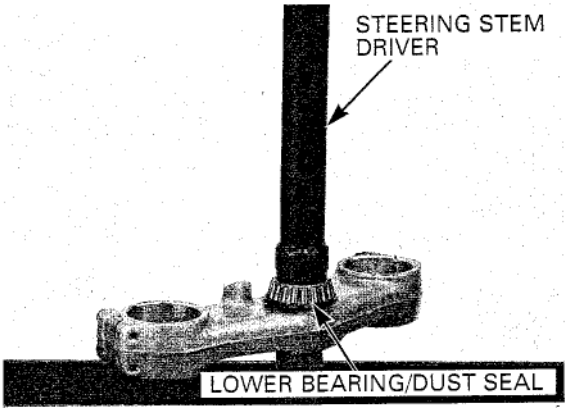
Temporarily install the steering stem nut onto the stem to prevent the threads from being damaged when removing the lower bearing from the stem.

Remove the lower bearing with a chisel or equivalent tool, being careful not to damage the stem.
Remove the dust seal.



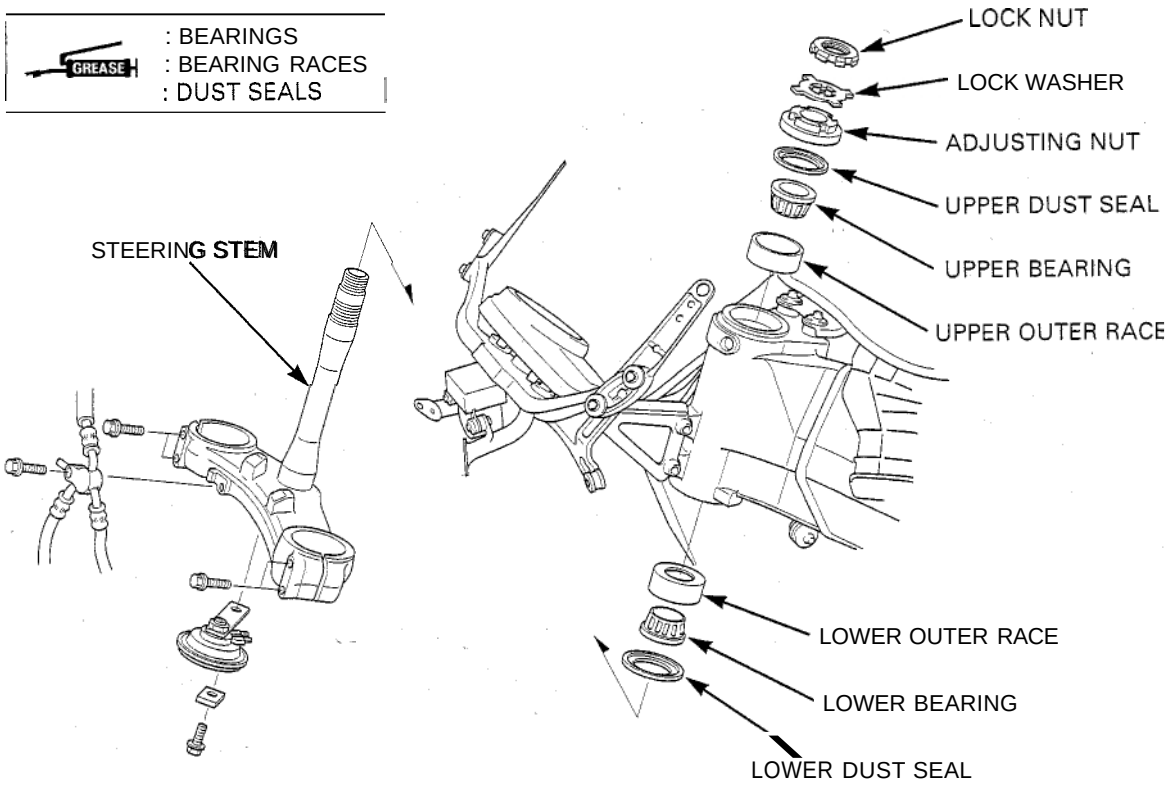
Apply grease to new dust seal lips and install it over the steering stem.
Install a new lower bearing using a special tool and a hydraulic press.

TOOL:
Steering stem driver **07946–MB00000**



INSTALLATION

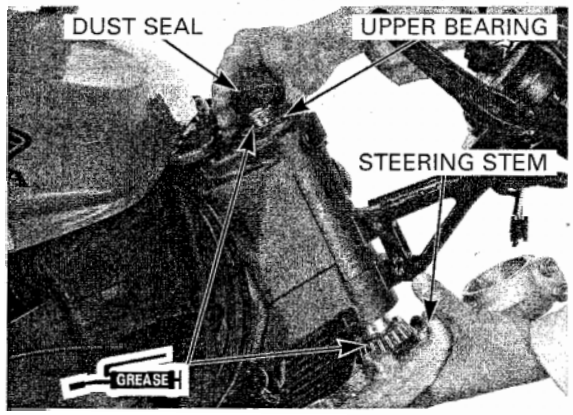
GREASE : BEARINGS
: BEARING RACES
: DUST SEALS



Apply grease to the upper and lower bearings and bearing races.

Insert the steering stem into the steering head pipe.

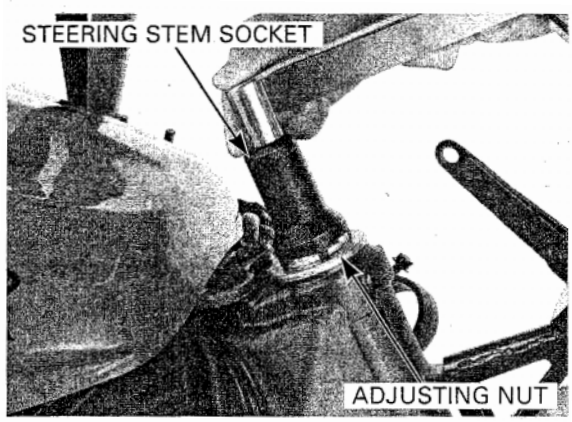
Install upper bearing and dust seal.



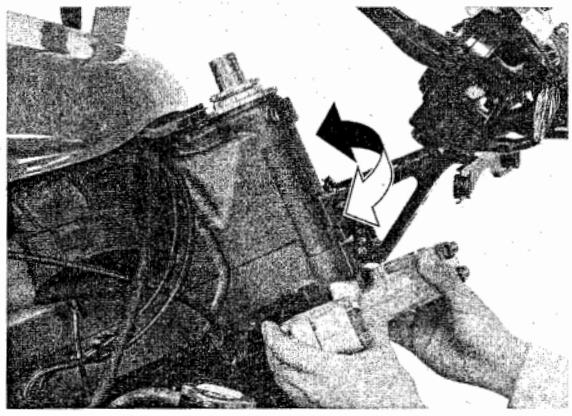
Apply oil to the bearing adjustment nut threads.
Install and tighten the stem adjusting nut to the initial torque.

TOOL:
Steering stem socket **07916–3710101 or 07916–3710100 (U.S.A. only)**

TORQUE: 40 N·m (4.1 kgf·m, 30 lbf·ft)



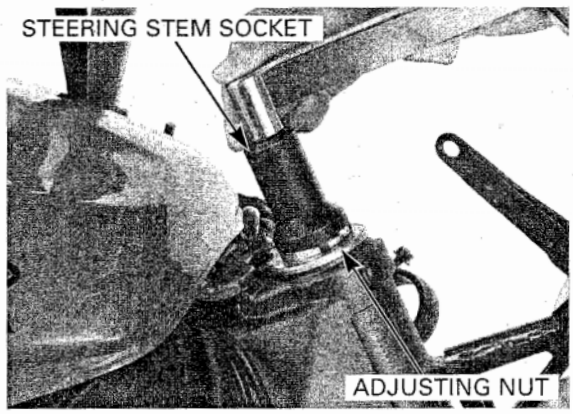
Move the steering stem right and left, lock-to-lock, five times to seat the bearings.
Make sure the steering stem moves smoothly, without play or binding; then loosen the steering stem adjusting nut.



Retighten the steering stem adjusting nut to the specified torque.

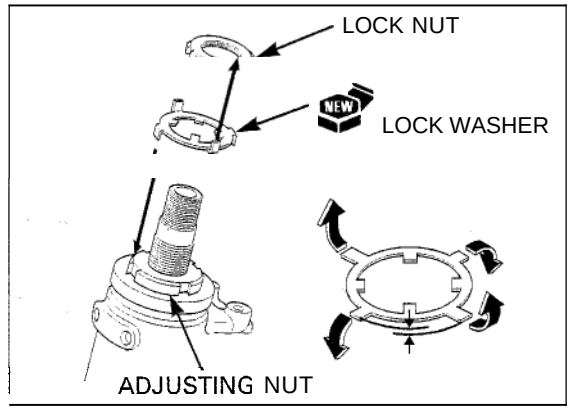
TORQUE: 18 N·m (1.8 kgf·m, 13 lbf·ft)

Recheck that the steering stem moves smoothly without play or binding.



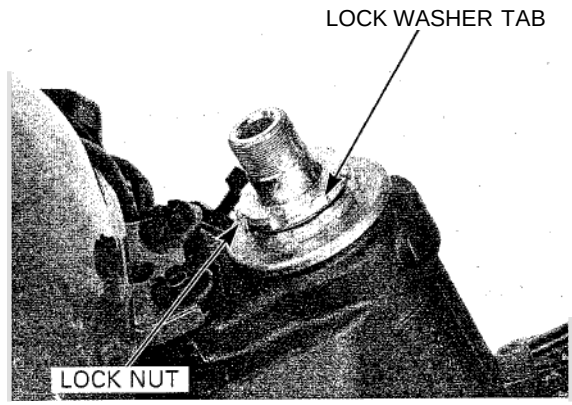
Install the new lock washer onto the steering stem.
Install and tighten the steering stem lock nut.

Align the tabs of the lock washer with the grooves in the lock nut and bend two opposite tabs (shorter) down into the adjusting nut groove.



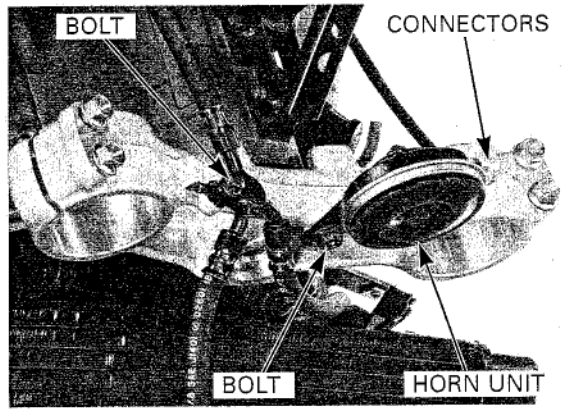
Install and finger tighten the lock nut.
Hold the lock nut and further tighten the lock nut within 1/4 turn (90') enough to align its grooves with the lock washer tabs.

Bend the lock washer tabs up into the lock nut groove.



Install the horn unit assembly and tighten the mounting bolt.
Connect the horn unit connectors.
Install the brake hose joint and tighten the mounting bolt.

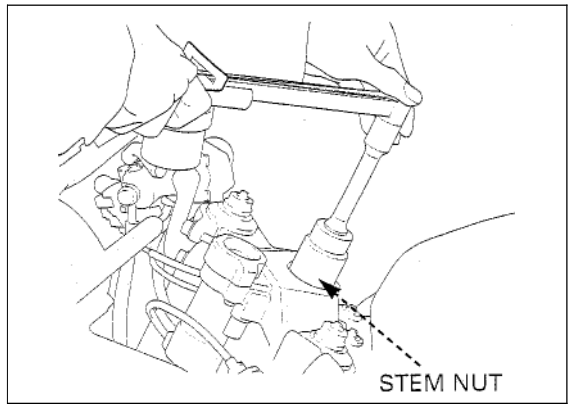
Install the following:
– Fork legs (page 13-25)
– Handlebar (page 13-6)



Install the top bridge and steering stem nut.
Tighten the steering stem nut to the specified torque.

TORQUE: 103 N•m (10.5 kgf•m, 76 lbf•ft)

Install the following:
– Front wheel (page 13-14)
– Upper cowl (page 2-6)



STEERING HEAD BEARING PRE-LOAD

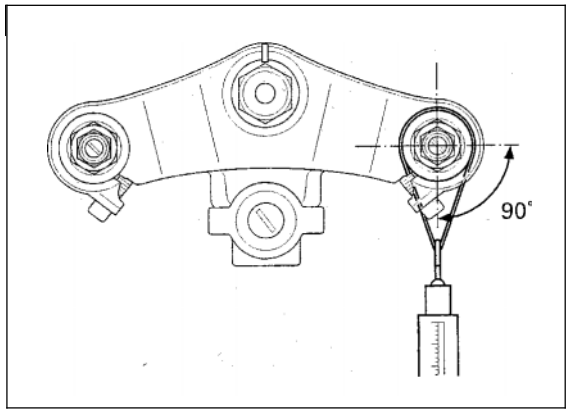
Jack-up the motorcycle to raise the front wheel off the ground.

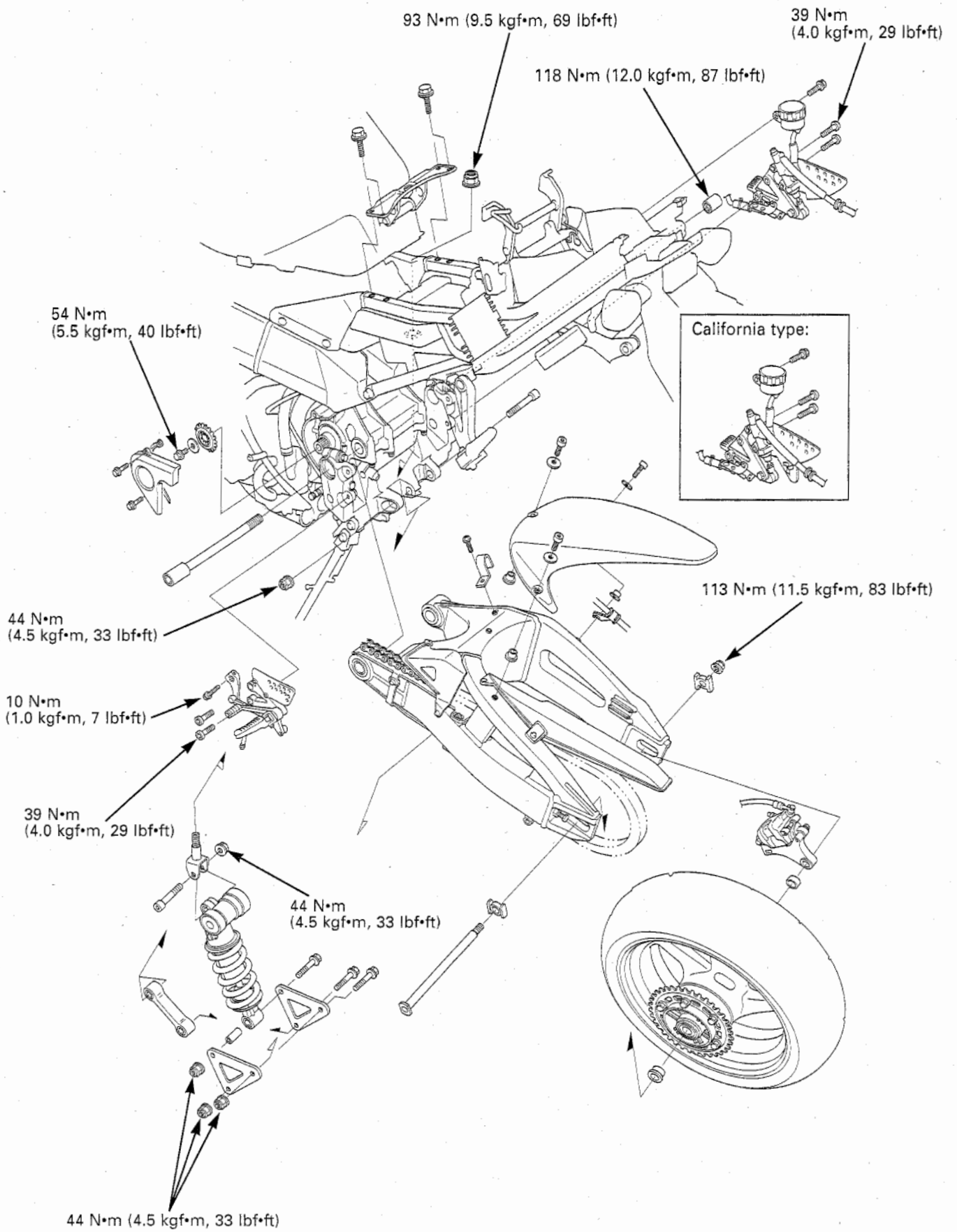
Position the steering stem straight ahead.

Make sure there is no cable or wire harness interference

Hook a spring scale to the fork pipe and measure the steering head bearing pre-load.

The pre-load should be within 11 – 16 N (1.1 – 1.6 kgf). If the readings do not fall within the limits, lower the front wheel to the ground and adjust the steering bearing adjusting nut.




93 N•m (9.5 kgf•m, 69 lbf•ft)
39 N•m
(4.0 kgf•m, 29 lbf•ft)
118 N•m (12.0 kgf•m, 87 lbf•ft)
54 N•m
(5.5 kgf•m, 40 lbf•ft)
California type:
113 N•m (11.5 kgf•m, 83 lbf•ft)
44 N•m
(4.5 kgf•m, 33 lbf•ft)
10 N•m
(1.0 kgf•m, 7 lbf•ft)
39 N•m
(4.0 kgf•m, 29 lbf•ft)
44 N•m
(4.5 kgf•m, 33 lbf•ft)
44 N•m (4.5 kgf•m, 33 lbf•ft)

14. REAR WHEEL/SUSPENSION

SERVICE INFORMATION	14-1	SUSPENSION LINKAGE	14-9
TROUBLESHOOTING	14-2	SHOCK ABSORBER	14-11
REAR WHEEL	14-3	SWINGARM	14-14

SERVICE INFORMATION

GENERAL

- A contaminated brake disc or pad reduces stopping power. Discard contaminated pads and clean a contaminated disc with a high quality brake degreasing agent.
- After rear wheel installation, check the brake operation by applying the brake pedal.
- The shock absorber contains nitrogen under high pressure. Do not allow fire or heat near the shock absorber.
- Before disposal of the shock absorber, release the nitrogen (page 74-13).
- When servicing the rear wheel, support the motorcycle using a safety stand or hoist.
- Refer to section 15 for brake system information.
- Use only tires marked "TUBELESS" and tubeless valves on rims marked "TUBELESS TIRE APPLICABLE".
- Use genuine Honda replacement bolts and nuts for all suspension pivot and mounting point.

SPECIFICATIONS

Unit: mm (in

ITEM			STANDARD	SERVICE LIMIT
Minimum tire tread depth			—	2.0 (0.08)
Cold tire pressure	Up to 90 kg (200 lb) load		290 kPa (2.90 kgf/cm², 42 psi)	—
	Up to maximum weight capacity		290 kPa (2.90 kgf/cm², 42 psi)	—
Axle runout			—	0.20 (0.008)
Wheel rim runout	Radial		—	2.0 (0.08)
	Axial		—	2.0 (0.08)
Wheel balance weight			—	60 g (2.1 oz) max.
Drive chain	Size/link	DID	DID 50VA8 C1/108	—
		RK	RK GB50HFOZ5/108	—
	Slack		40 – 50 (1.6 – 2.0)	50 (2.0)
Shock absorber	Spring adjuster standard position		4th groove	—
	Tension adjuster initial setting		2 turns from full hard	—
	Compression adjuster initial setting		2 turns from full hard	—

14

TORQUE VALUES

Rear axle nut	113 N•m (11.5 kgf-m, 83 lbf•ft)	U-nut
Rear brake disc mounting bolt	42 N•m (4.3 kgf-m, 31 lbf•ft)	ALOC bolt
Driven sprocket nut	64 N•m (6.5 kgf•m, 47 lbf•ft)	U-nut
Shock absorber upper bracket mounting nut	93 N•m (9.5 kgf•m, 69 lbf•ft)	U-nut
Shock absorber upper mounting nut	44 N•m (4.5 kgf-m, 33 lbf•ft)	U-nut
Shock arm plate nut	44 N•m (4.5 kgf-m, 33 lbf•ft)	U-nut
Shock link nut (frame side)	44 N•m (4.5 kgf-m, 33 lbf•ft)	U-nut
Swingarm pivot nut	118 N•m (12.0 kgf-m, 87 lbf•ft)	U-nut
Swingarm pivot pinch bolt	26 N•m (2.7 kgf-m, 20 lbf•ft)	
Drive chain slider bolt	9 N•m (0.9 kgf•m, 6.5 lbf•ft)	Apply a locking agent to the threads.
Main footpeg bracket socket bolt	39 N•m (4.0 kgf-m, 29 lbf•ft)	
Drive sprocket special bolt	54 N•m (5.5 kgf•m, 40 lbf•ft)	
Brake hose guide screw	4 N•m (0.4 kgf-m, 2.9 lbf•ft)	

TOOLS

Driver	07749–0010000
Attachment, 42 x 47 mm	07746–0010300
Attachment, 52 x 55 mm	07746–0010400
Attachment, 22 x 24 mm	07746–0010800
Attachment, 40 x 42 mm	07746–0010900
Pilot, 17 mm	07746–0040400
Pilot, 25 mm	07746–0040600
Bearing remover shaft	07746–0050100
Bearing remover head, 25 mm	07746–0050800
Rod holder, 24 x 27 mm	07930–KA50100
Driver shaft	07946–MJ00100
Driver	07949–3710001
Needle bearing remover	07LMC–KV30100
Pilot, 32 *x* 50 mm	07MAD–PR90200
Driver attachment, 25 x 38.5 mm	07YMD–MCJO100

TROUBLESHOOTING

Soft suspension
- Weak shock absorber spring
- Incorrect suspension adjustment
- Oil leakage from damper unit
- Tire pressure too low

Hard suspension
- Damaged shock absorber mounting bearing
- Bent damper rod
- Damaged suspension linkage bearings
- Damaged swingarm pivot bearings
- Bent swingarm pivot
- Incorrect suspension adjustment
- Tire pressure too high

Steers to one side or does not track straight
- Bent rear axle
- Axle alignment/chain adjustment not equal on both sides

Rear wheel wobbling
- Bent rim
- Worn rear wheel bearings
- Faulty tire
- Unbalanced tire and wheel
- Tire pressure too low
- Faulty swingarm pivot bearings

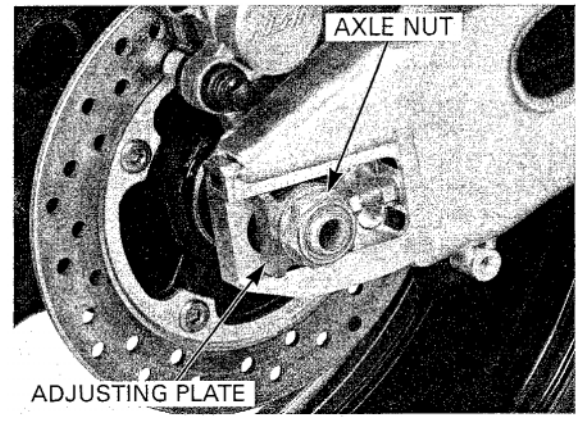
REAR WHEEL

REMOVAL

Support the motorcycle using a safety stand or hoist, raise the rear wheel off the ground.

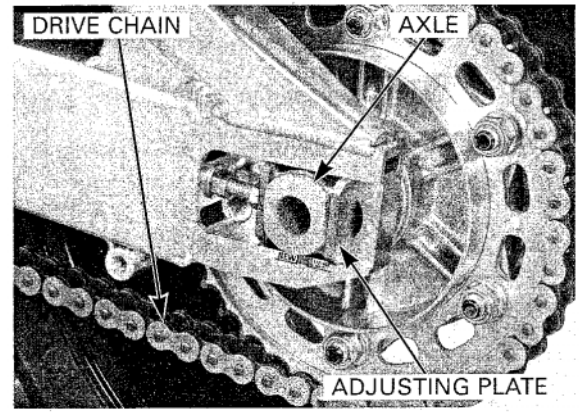
Adjust the drive chain slack fully (page 3-20).

Remove the axle nut and drive chain adjusting plate.

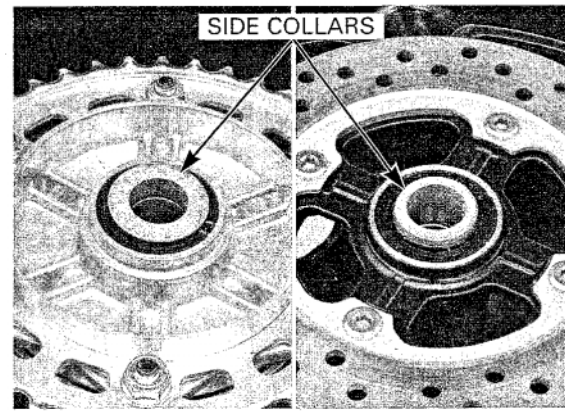


Push the rear wheel forward.
Remove the drive chain from the driven sprocket.

Remove the axle and drive chain adjusting plate from the left side and remove the rear wheel.



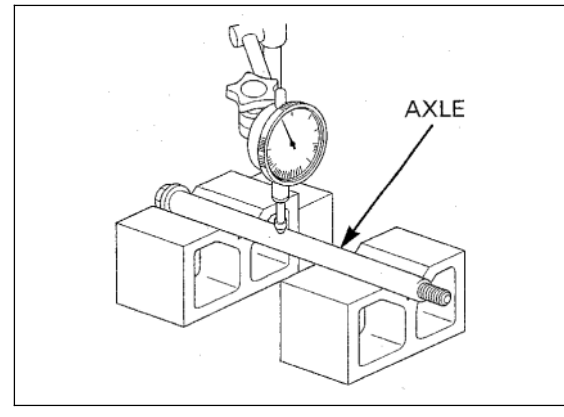
Remove the side collars.



INSPECTION

Axle
Place the axle in V-blocks and measure the runout.
Actual runout is 1/2 the total indicator reading.

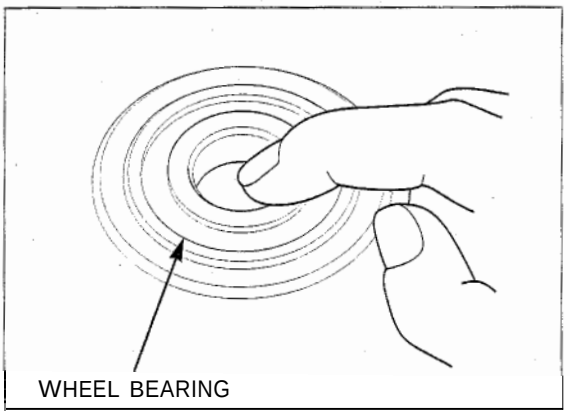
SERVICE LIMIT: *0.20* mm *(0.008* in)



Wheel bearing
Turn the inner race of each bearing with your finger. Bearings should turn smoothly and quietly. Also check that the bearing outer race fits tightly in the hub.

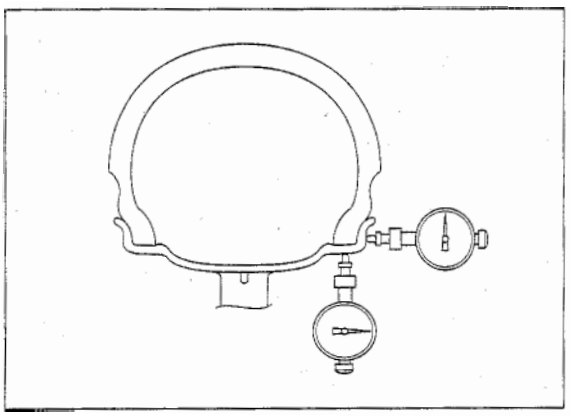
Replace the wheel bearings in pairs

Remove and discard the bearings if the races do not turn smoothly and quietly, or if they fit loosely in the hub.



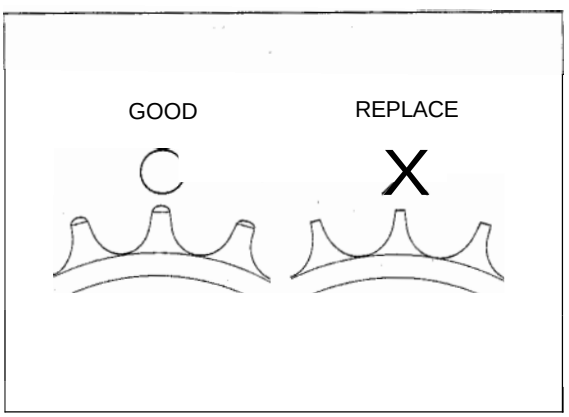
Wheel rim runout
Check the rim runout by placing the wheel in a true-ing stand.
Spin the wheel slowly and read the runout using a dial indicator.
Actual runout is 1/2 the total indicator reading.

SERVICE LIMITS: Radial: 2.0 mm (0.08 in)
Axial: 2.0 mm (0.08 in)



Driven sprocket
Check the condition of the final driven sprocket teeth. Replace the sprocket if worn or damaged.

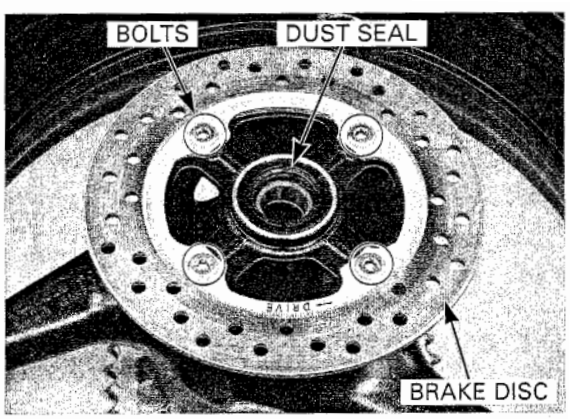
- If the final driven sprocket requires replacement, inspect the drive chain and drive sprocket.
- Never install a new drive chain on a worn sprocket or a worn chain on new sprockets. Both chain and sprocket must be in good condition or the replacement chain or sprocket will wear rapidly.



Wheel balance
See page 13-11 for wheel balance.

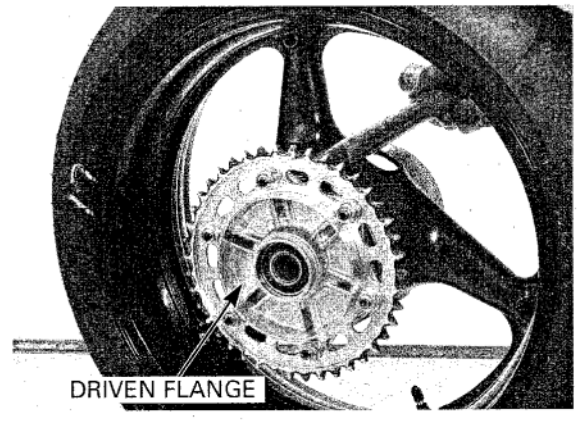
DISASSEMBLY

Remove the bolts and brake disc.
Remove the right dust seal.

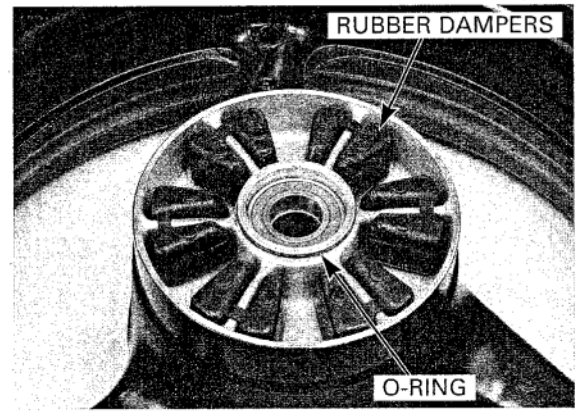


If you disassemble the driven flange, ioosen the driven sprocket nuts before removing the driven flange from the wheel hub

Remove the driven flange assembly from the left wheel hub.



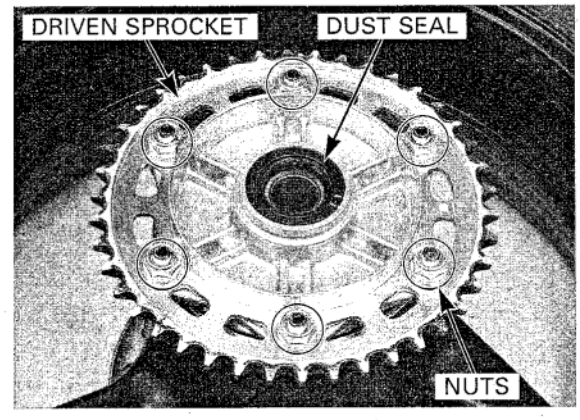
Remove the wheel rubber dampers.
Remove the O-ring.



Driven flange bearing removal
Loosen the driven sprocket nuts.

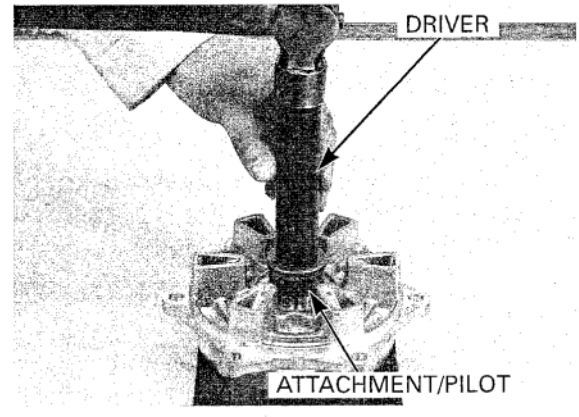
Remove the driven flange from the wheel hub, then remove the driven sprocket nuts and sprocket.

Remove the dust seal.



Remove the driven flange collar.

Drive out the driven flange bearing.

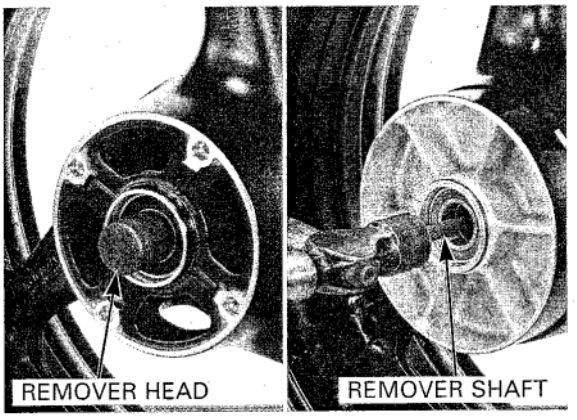


Wheel bearing removal

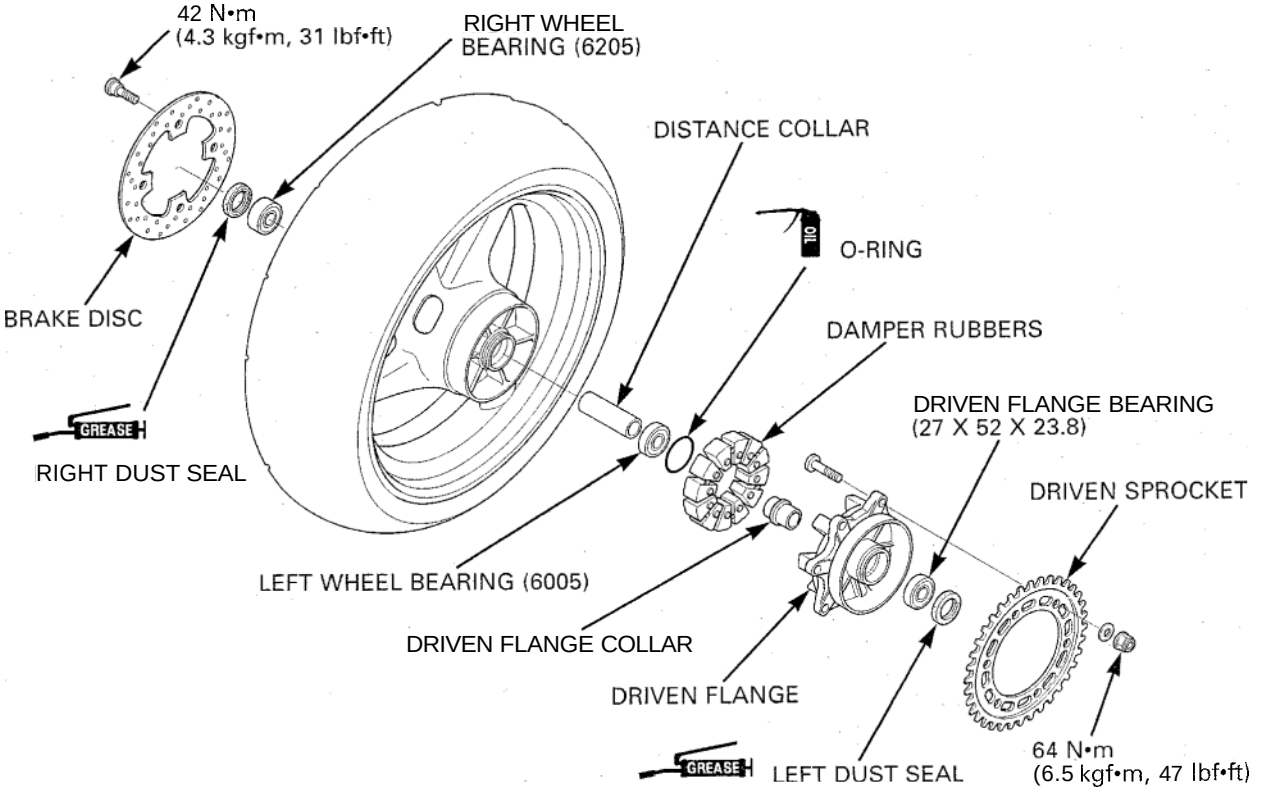
Install the bearing remover head into the bearing. From the opposite side install the bearing remover shaft and drive the bearing out of the wheel hub. Remove the distance collar and drive out the other bearing.

TOOLS:

Bearing remover head, 25 mm	**07746-0050800**
Bearing remover shaft	**07746-0050100**



ASSEMBLY



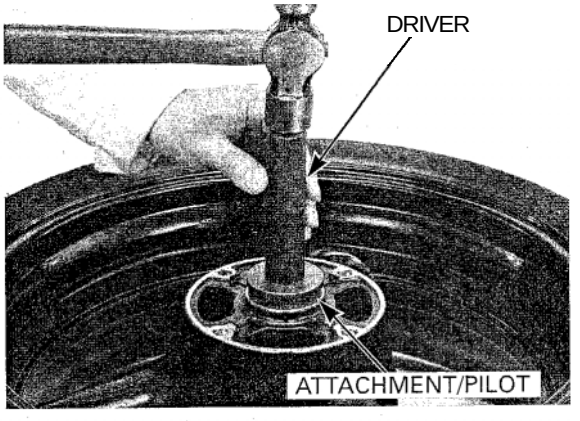
Never install the old bearings, once the bearings have been removed, they must be replaced with new ones

Wheel bearing installation

Drive in a new right bearing (6205) squarely.

TOOLS:

Driver	**07749-0010000**
Attachment, 52 x 55 mm	**07746-0010400**
Pilot, 25 mm	**07746-0040600**

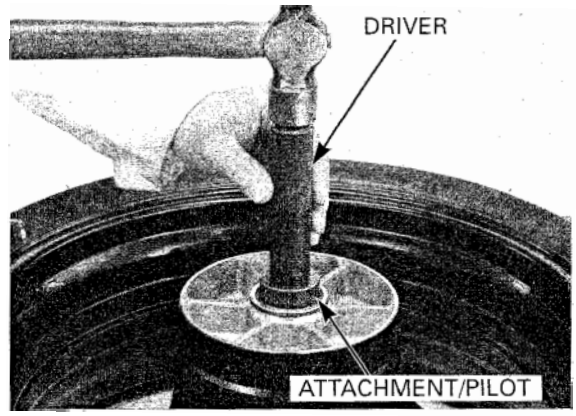


Install the distance collar

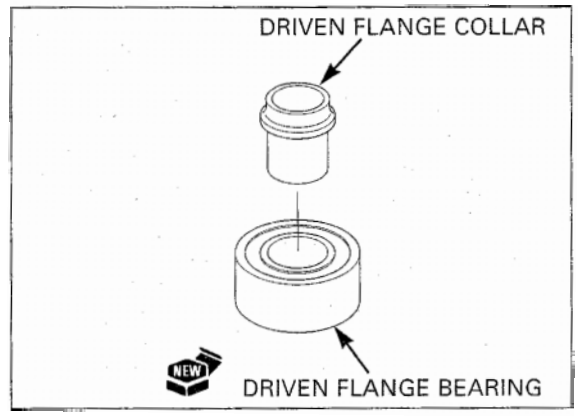
Drive in a new left side bearing using the special tools.

TOOLS:

Driver	**07749-0010000**
Attachment, 42 x 47 mm	**07746-0010300**
Pilot, *25* mm	**07746-0040600**



Install the driven flange collar into a new driven flange bearing (27 x 52 X *23.8).*

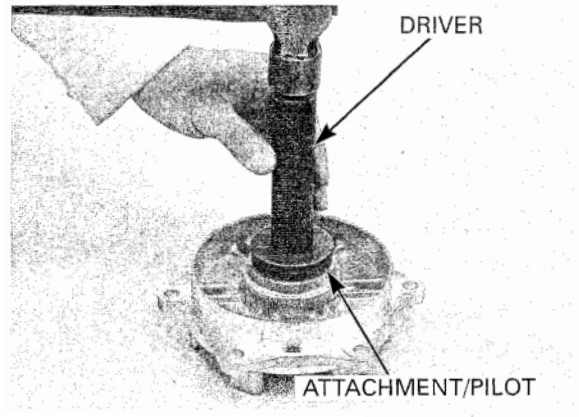


Driven flange bearing installation

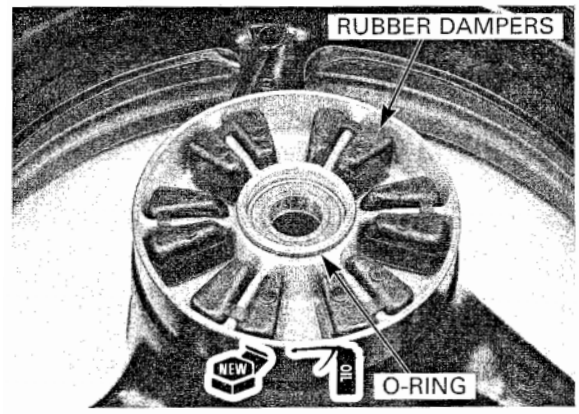
Drive the new driven flange bearing into the driven flange using the special tools.

TOOLS:

Driver	**07749-0010000**
Attachment, 52 x *55* mm	**07746-0010400**
Pilot, 25 mm	**07746-0040600**



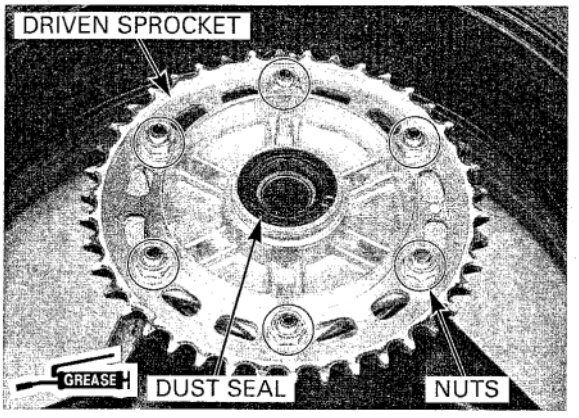
Install the wheel rubber dampers into the wheel hub. Apply oil to the new O-ring and install it into the groove of the wheel hub.



Install the driven flange assembly into the left wheel hub.
If the driven sprocket was removed, install the driven sprocket and tighten the nuts.

TORQUE: 64 N·m (6.5 kgf·m, 47 lbf·ft)

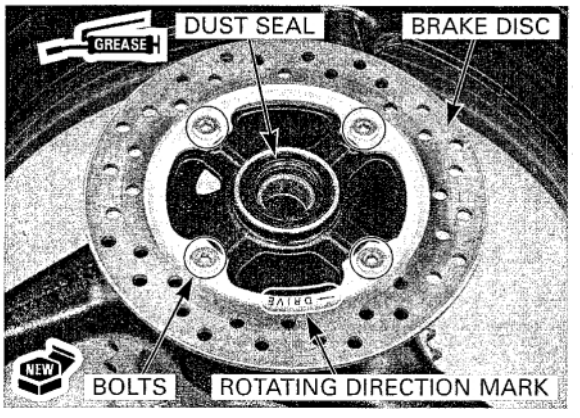
Apply grease to the dust seal lips, then install it into the driven flange.



Install the brake disc with its direction of rotation mark facing out.
Install and tighten the new bolts to the specified torque.

TORQUE: 42 N·m (4.3 kgf·m, 31 lbf·ft)

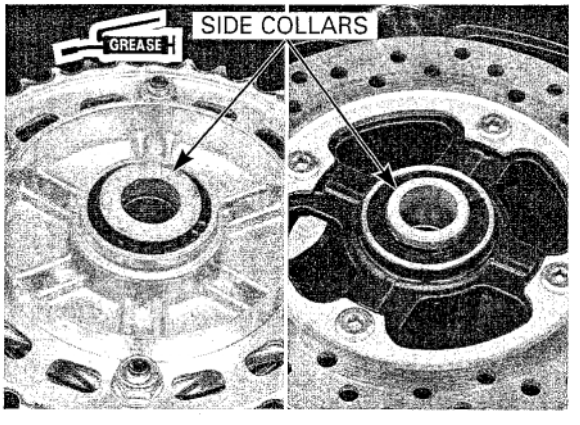
Apply grease to the dust seal lips, then install it into the wheel hub.



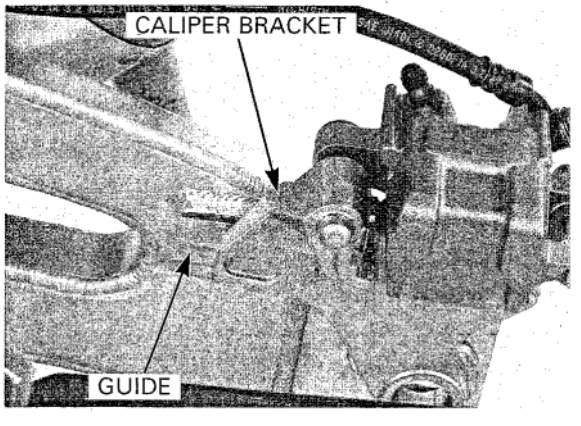
INSTALLATION

Apply grease to the side collar inside and grooves.

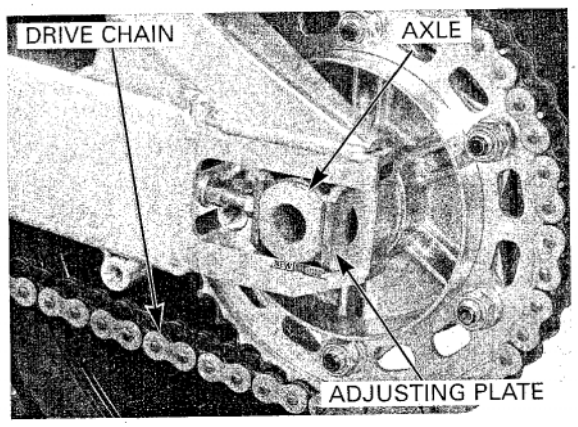
Install the side collars.



Install the rear brake caliper bracket onto the guide *of* the swingarm.



Place the rear wheel into the swingarm.
Install the drive chain over the driven sprocket.
Install the drive chain adjusting plate and axle from the left side.

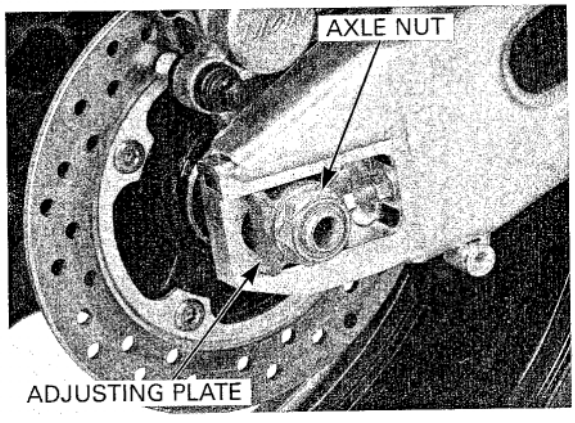


Install the drive chain adjusting plate and axle nut.

Adjust the drive chain stack (page 3-20).

Tighten the axle nut to the specified torque.

TORQUE: 113 N•m (11.5kgf•m, 83 lbf•ft)

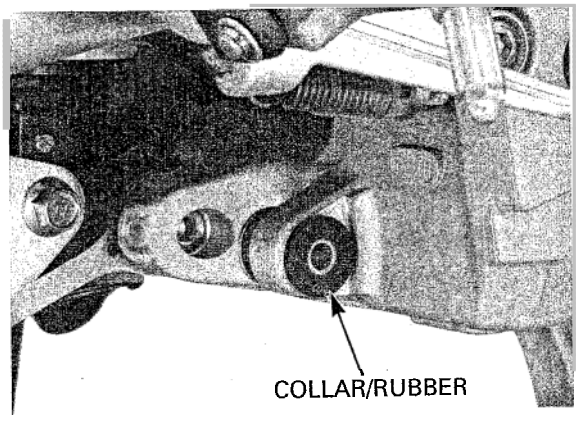


SUSPENSION LINKAGE

REMOVAL

Support the motorcycle using a hoist or equivalent, and raise the rear wheel off the ground.
Remove the muffler and exhaust pipe (page 2-13).

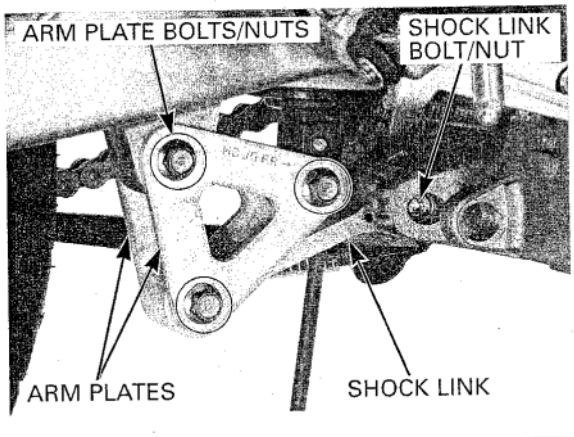
Remove the exhaust pipe mounting collar and mounting rubber.



Remove the following:
- Shock arm plate bolts/nuts
- Shock arm plates
- Shock link bolt/nut
- Shock link

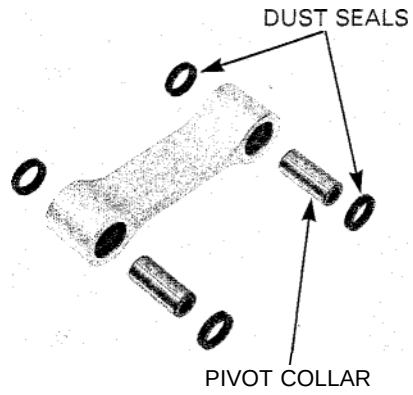
INSPECTION

Check that the suspension linkage components for damage, replace any damaged components.



SHOCK LINK BEARING REPLACEMENT

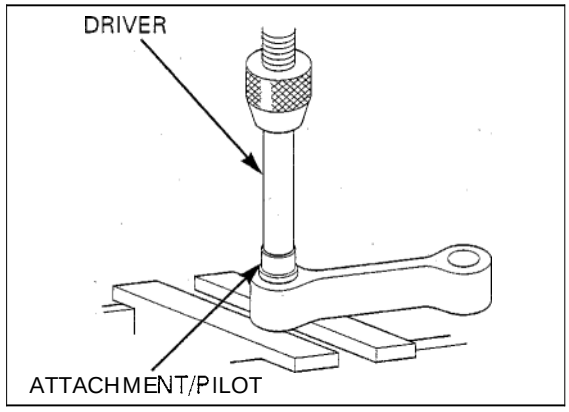
Remove the pivot collar and dust seals.



Press out the needle bearing out of the shock link using the special tools.

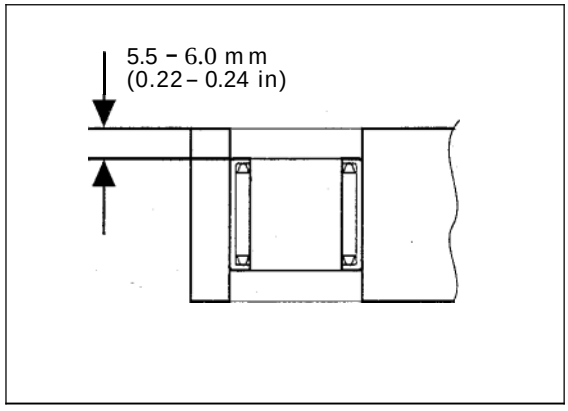
TOOLS:

Driver	**07949–3710001**
Attachment, 22 x 24 mm	**07746–0010800**
Pilot, 17 mm	**07746–0040400**

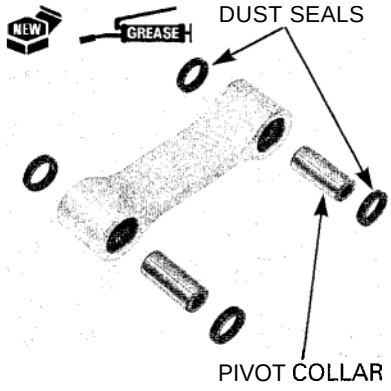


Press ?heneedle bearing into the shock arm with the marked side facing out

Press a new needle bearing into the shock arm so the needle bearing surface is lower 5.5 – 6.0 mm (0.22 – 0.24 in) from the end of the shock link using the same tools.



Apply grease to the new dust seal lips, install them into the shock link.
Install the pivot collar.



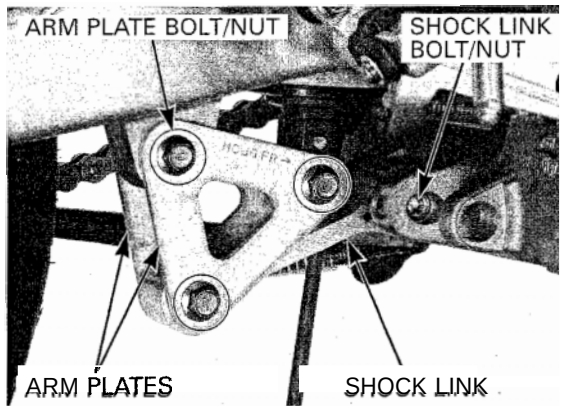
INSTALLATION

Install the shock link into the lower bracket, install the mounting bolt/nut.
Hold the socket bolt and tighten the nut to the specified torque.

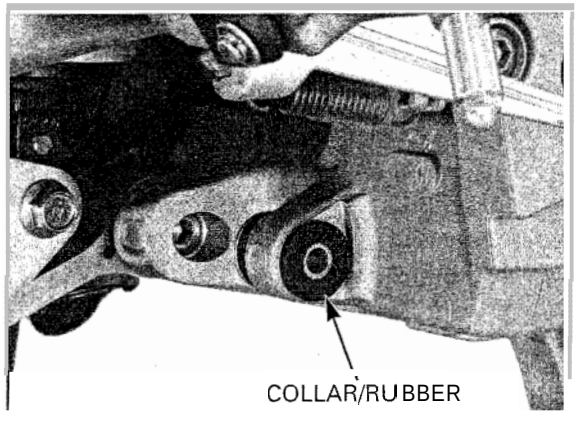
TORQUE: 44 N·m (4.5 kgf·m, 33 lbf·ft)

Install the shock arm plates with its "FR" mark facing forward.
Install the shock arm plate bolts/nuts, then tighten the nuts to the specified torque.

TORQUE: 44 N·m (4.5 kgf·m, 33 lbf·ft)



Install the exhaust pipe mounting rubber and collar.



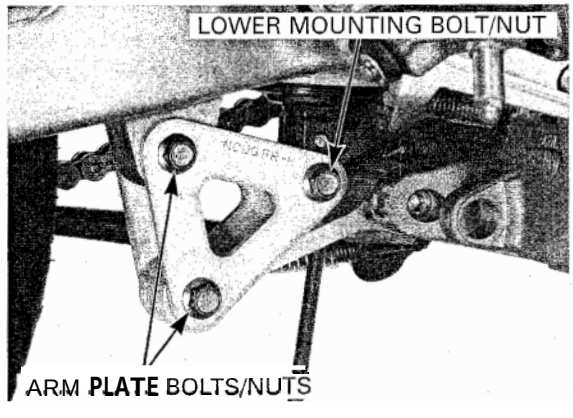
Install the exhaust pipe and muffler (page 2-16).

SHOCK ABSORBER

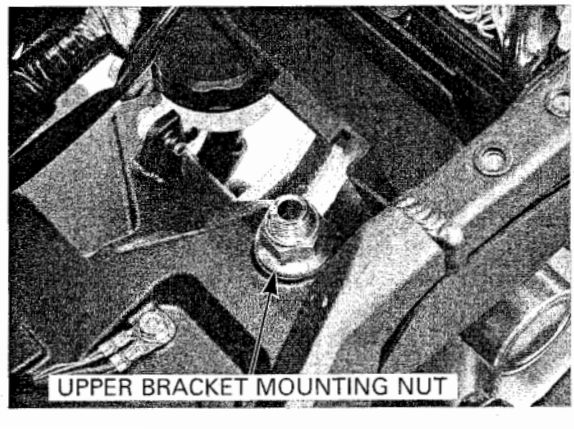
REMOVAL

Support the motorcycle using a hoist or equivalent.

Remove the shock absorber lower mounting bolt/nut.
Remove the shock arm plate bolts/nuts and link plates.



Loosen and remove the shock absorber upper mounting nut.
Lower the shock absorber, then remove.

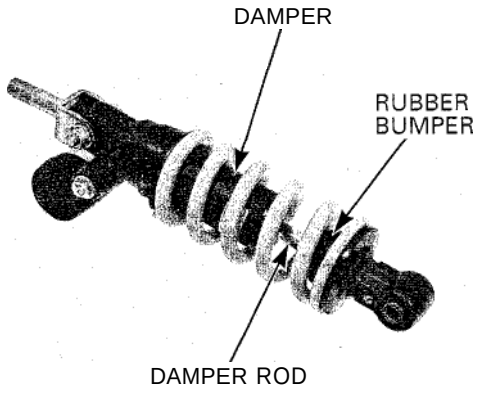


INSPECTION

Visually inspect the shock absorber for damage.

Check the:
- Damper rod for bends or damage
- Damper unit for deformation or oil leaks
- Rubber bumper for wear or damage

Inspect all the other parts for wear or damage.
If necessary, replace the shock absorber as an assembly.



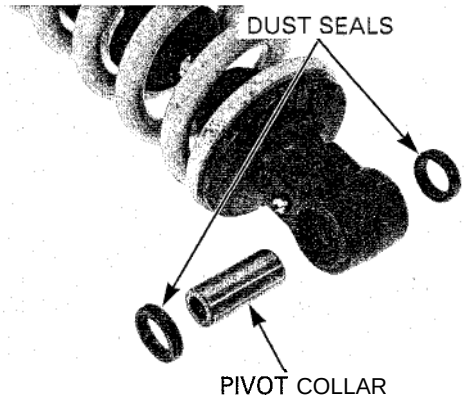
NEEDLE BEARING REPLACEMENT

Remove the pivot collar and dust seals.

Press out the needle bearing out of the shock absorber lower mount using the special tools.

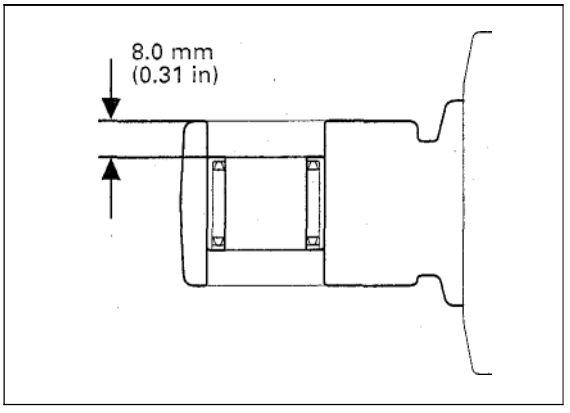
TOOLS:

Driver	**07949–3710001**
Attachment, 22 x 24 mm	**07746–0010800**
Pilot, 17 mm	**07746–0040400**

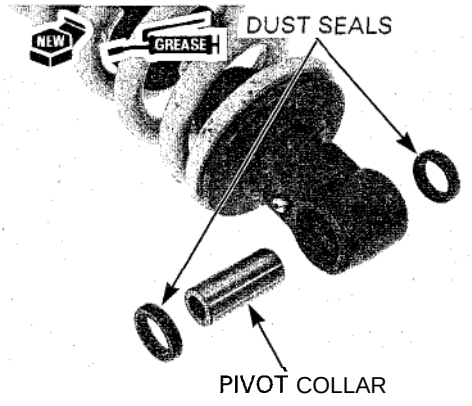


Press the needle bearing into the lower mount with the marked side facing out.

Press a new needle bearing into the lower mount so that the needle bearing surface is lower 8.0 mm (0.31 in) from the end of the lower mount using the same tools.

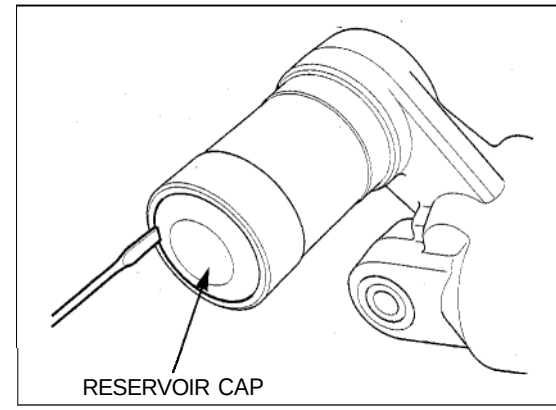


Apply grease to the new dust seal lips, install them into the lower mount.
Install the pivot collar.



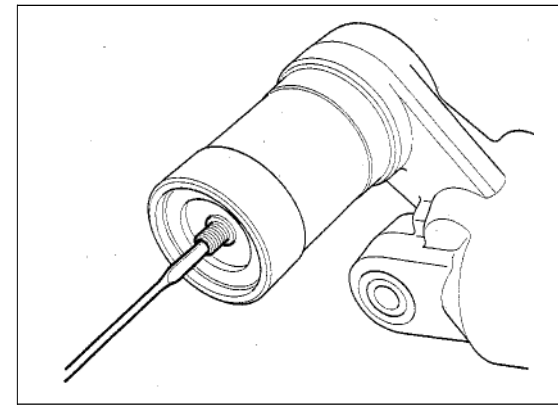
SHOCK ABSORBER DISPOSAL PROCEDURE

Remove the damper reservoir cap.



Do not remove the valve core until pressure is released.

Put on safety glasses, then release the nitrogen from the reservoir by depressing the valve core.



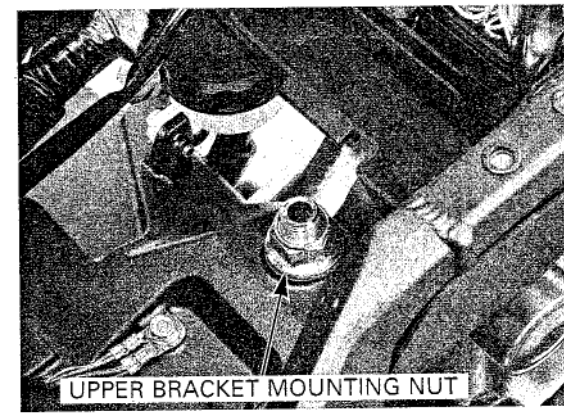
NOTICE

- *Point the valve away from you to prevent debris getting in your eyes.*
- *Before disposing of the shock absorber, release the nitrogen by pressing the valve core. Then remove the valve from the shock absorber reservoir.*

INSTALLATION

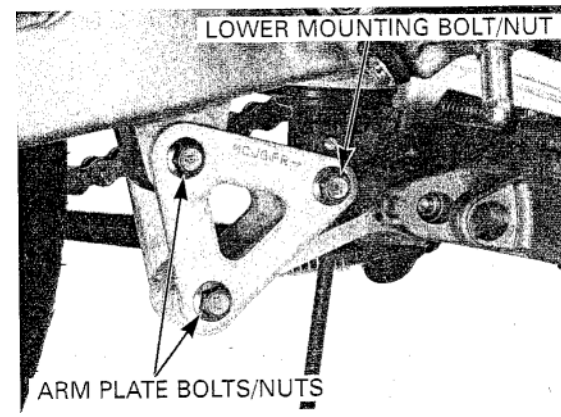
Install the shock absorber into the frame from the bottom, and install the upper mounting bolt/nut.
Tighten the nut to the specified torque.

TORQUE: 93 N·m (9.5 kgf·m, 69 lbf·ft)



Install the shock arm plates, arm plate bolts/nuts and shock absorber lower mounting bolt/nut.
Tighten the nuts to the specified torque.

TORQUE: 44 N·m (4.5 kgf·m, 33 lbf·ft)

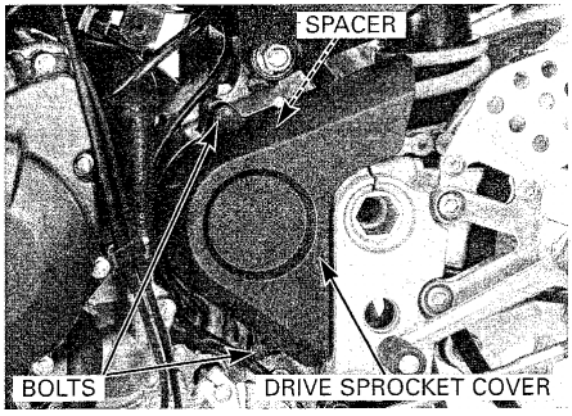


SWINGARM

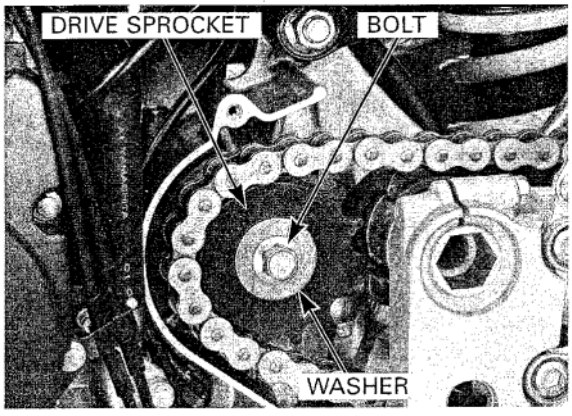
REMOVAL

Remove the rear wheel (page 14-3)

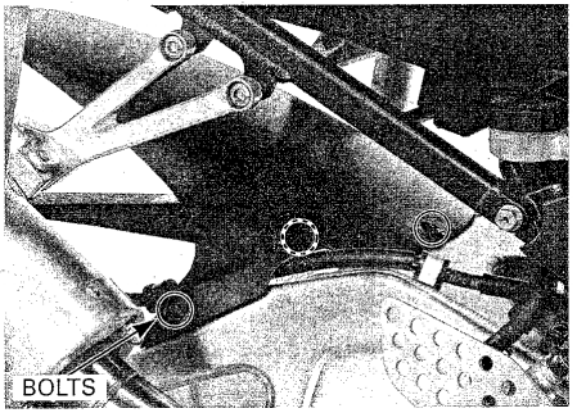
Remove the two SH bolts and drive sprocket cover and spacer.



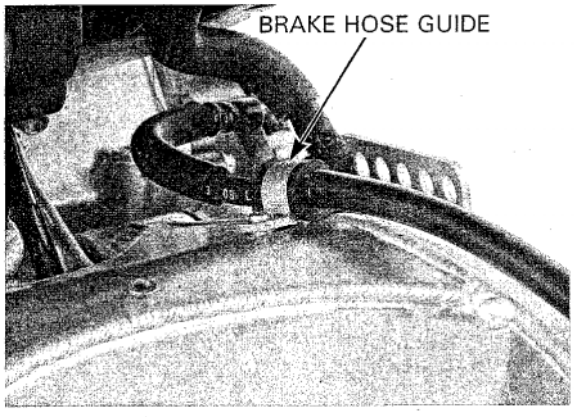
Remove the drive sprocket bolt, washer and drive sprocket.



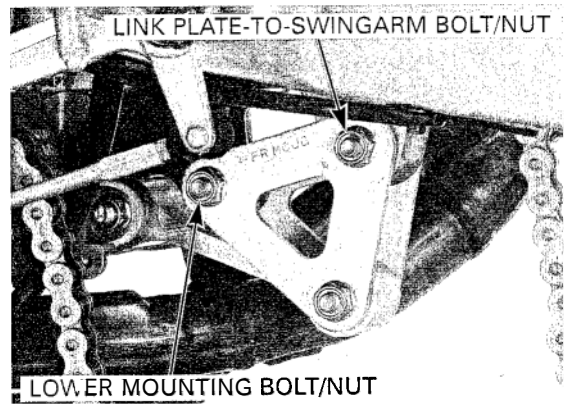
Remove the bolts and inner fender.



Remove the screws and brake hose guides.



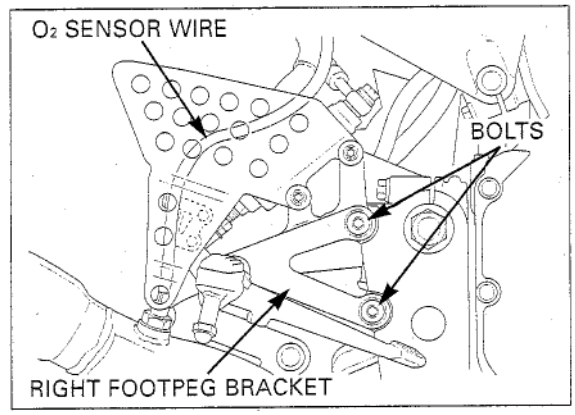
Remove the shock absorber lower mounting bolt/nut.
Remove the shock arm plate-to-swingarm bolt/nut.



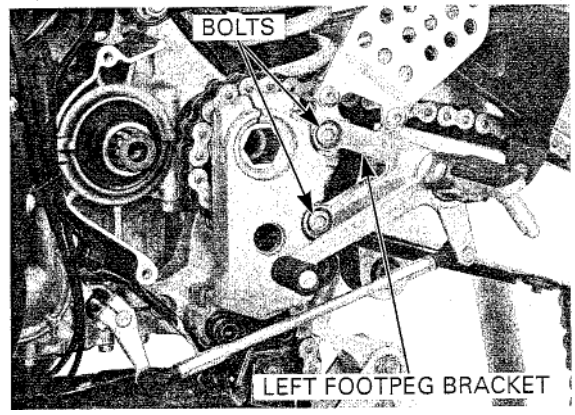
Remove the right main footpeg bracket socket bolts and main footpeg bracket.

California type only

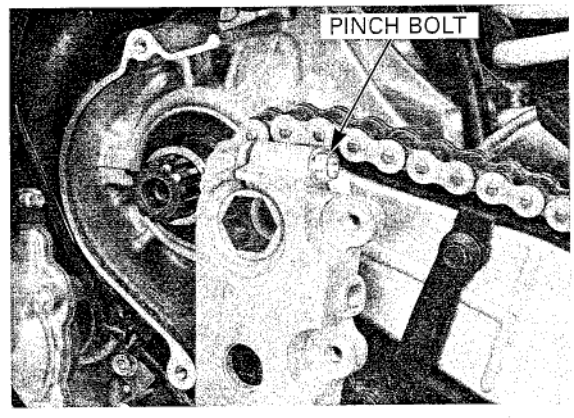
Release the O_2 sensor wire from the wire guide behind the right step guard.



Remove the bolt and gearshift link arm from the gearshift spindle.
Remove the left main footpeg bracket socket bolts and main footpeg bracket.

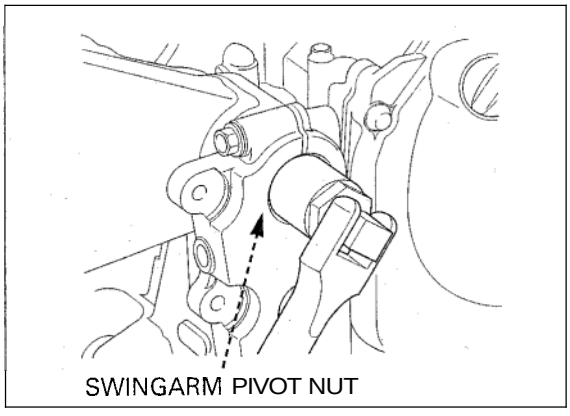


Loosen the swingarm pivot pinch bolts.

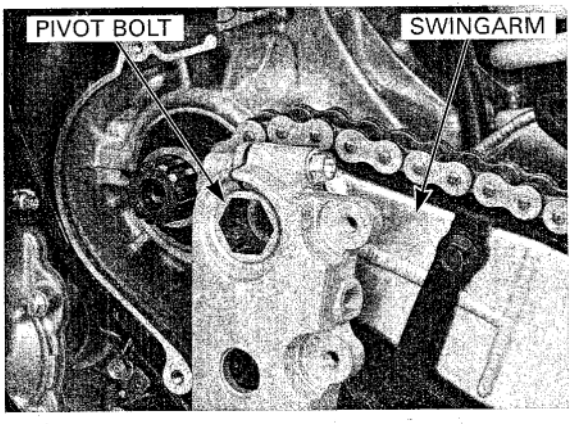


Hold the pivot bolt using a special tool, then loosen and remove the swingarm pivot nut using the same tool.

TOOL:
Rod holder, 24 x 27 mm **07930–KA50100**

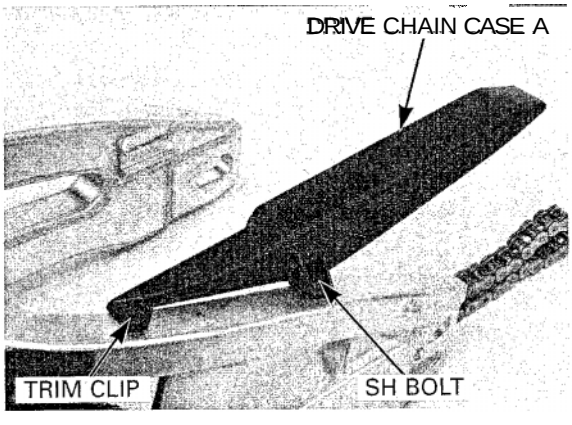


Remove the pivot bolt and then remove the swingarm from the lower bracket and engine.

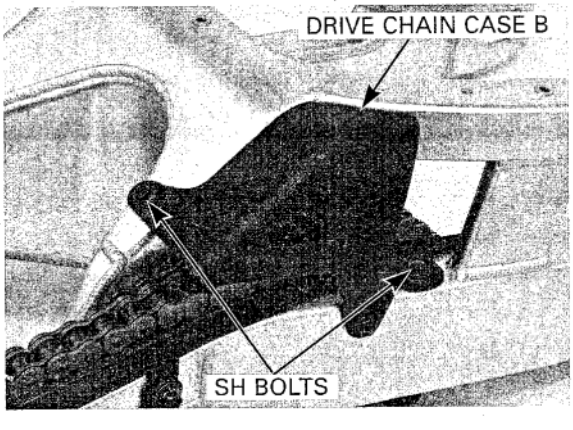


DISASSEMBLY/INSPECTION

Remove the SH bolt, trim clip and drive chain case A

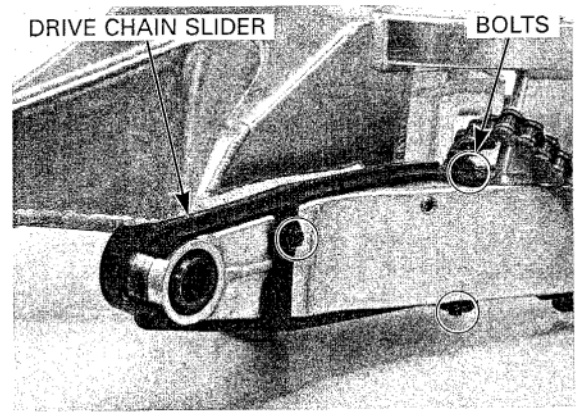


Remove the **SH** bolts and drive chain case B.



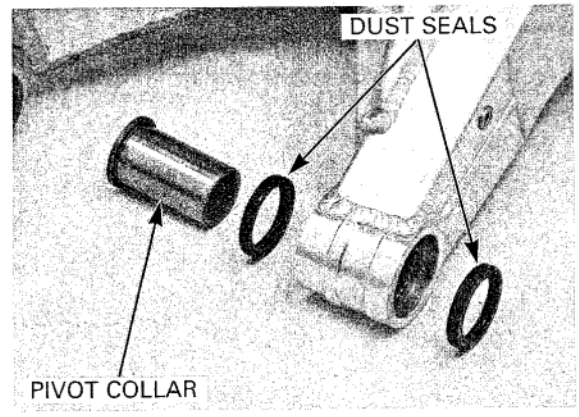
Remove the three SH bolts and drive chain slider.

Check the drive chain slider for wear or damage.



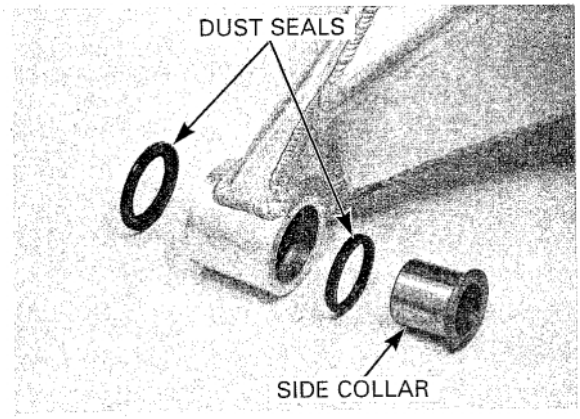
Remove the pivot collar and dust seals from the swingarm left pivot.

Check the dust seals and collar for damage or fatigue.



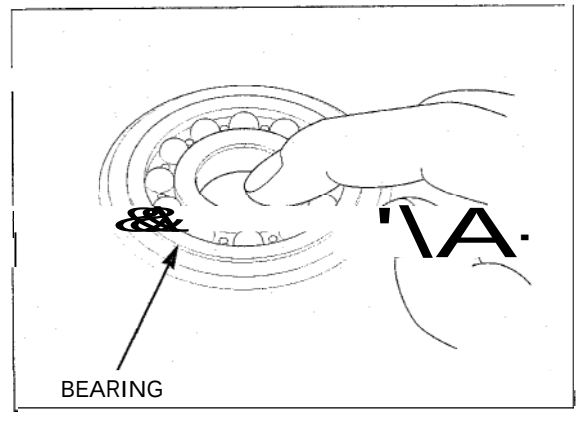
Remove the side collar and dust seals from the swingarm right pivot.

Check the dust seals and side collar for damage or fatigue.



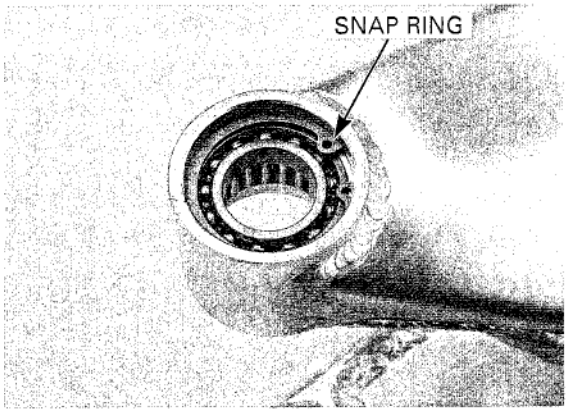
Turn the inner race of right pivot bearings with your finger.
The bearings should turn smoothly and quietly. Also check that the bearing outer race fits tightly in the hub.

Remove and discard the bearings if the races do not turn smoothly and quietly, or if they fit loosely in the pivot.



PIVOT BEARING REPLACEMENT

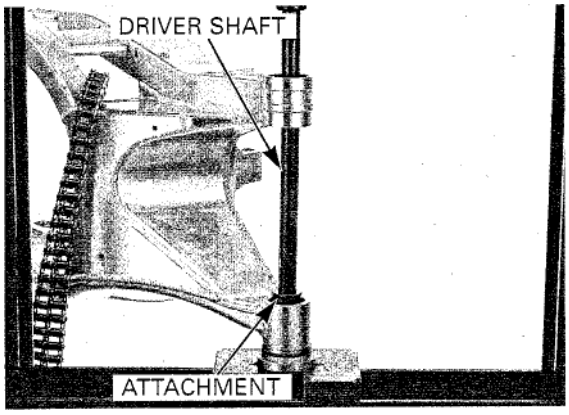
Remove the snap ring from the swingarm right pivot.



Remove the right pivot bearings (radial ball bearing and needle bearing) from the swingarm pivot using the special tools and hydraulic press.

TOOLS:

Driver shaft	**07946–MJ00100**
Driver attachment, 25 x 38.5 mm	**07YMD–MCJ0100**

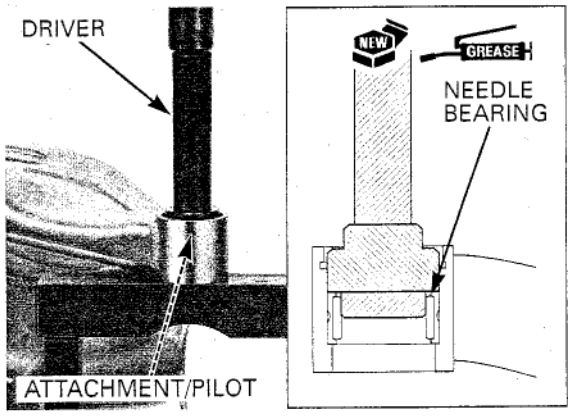


Pack a new needle bearing with grease.

Press the inner bearing into the swingarm right pivot until it seats using the special tools and hydraulic press.

TOOLS:

Driver	**07749–0010000**
Attachment, 40 x 42 mm	**07746–0010900**
Pilot, 25 mm	**07746–0040600**

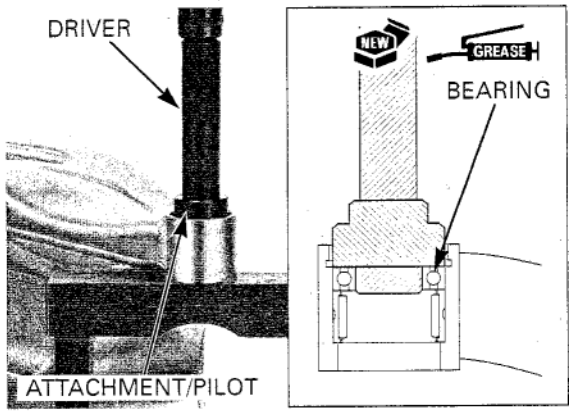


Pack a new bearing with gre se.

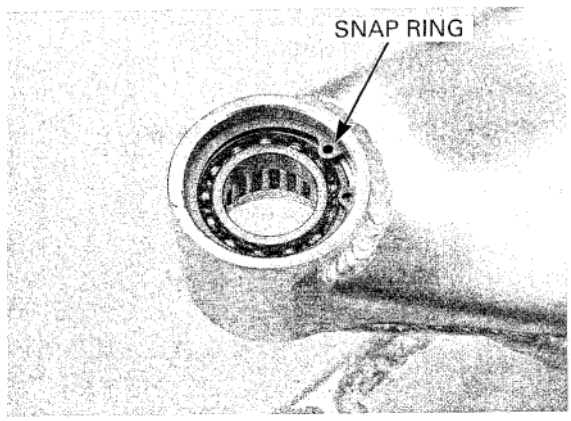
Install the outer bearing using the special tools.

TOOLS:

Driver	**07749–0010000**
Attachment, 40 x 42 mm	**07746–0010900**
Pilot, 25 mm	**07746–0040600**



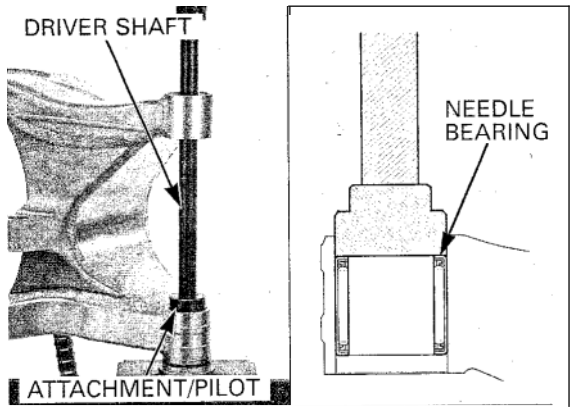
Install the snap ring into the groove securely.



Remove the left pivot needle bearing from the swingarm pivot using the special tools.

TOOLS:

Driver	**07749–0010000**
Attachment, 40 x 42 mm	**07746–0010900**



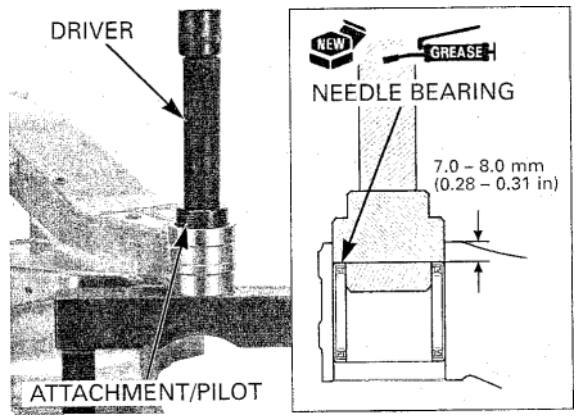
Press the needle bearing into the swingarm with the marked side facing out

Pack a new needle bearing with grease.

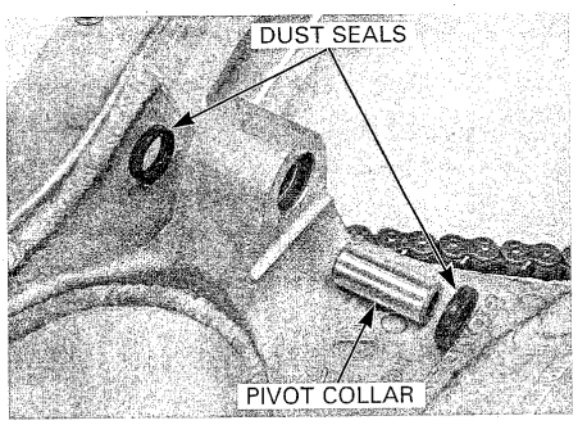
Press a new left pivot needle bearing into the swingarm pivot so that the needle bearing surface is lower 7.0 – 8.0 mm (0.28 – 0.31 in) from the end of the swingarm pivot surface using the special tools.

TOOLS:

Driver	**07749–0010000**
Attachment, 40 x 42 mm	**07746–0010900**
Pilot, 32 x 50 mm	**07MAD–PR90200**

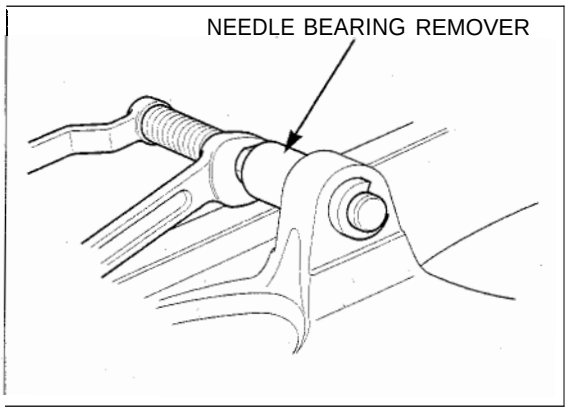


Remove the pivot collar and dust seals from the shock arm pivot.



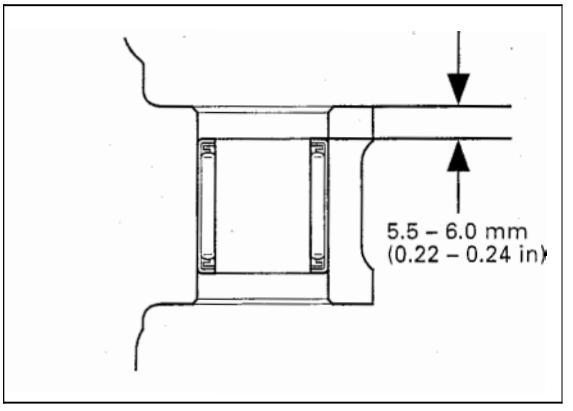
Remove the shock arm pivot needle bearing using the special tool.

TOOL:
Needle bearing remover **07LMC–KV30100**

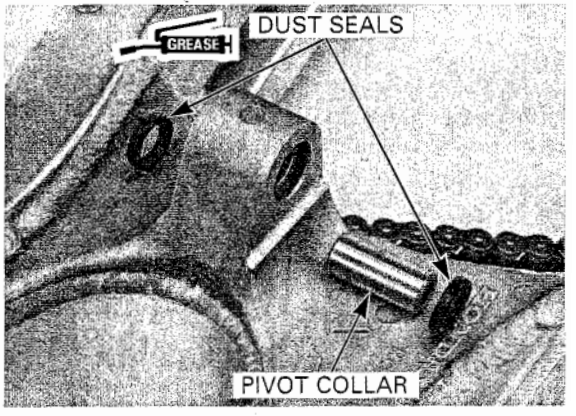


Install the shock arm pivot needle bearing into the swingarm so the needle bearing surface is lower 5.5 – 6.0 mm (0.22 – 0.24 in) from the end of the pivot surface using the same tool.

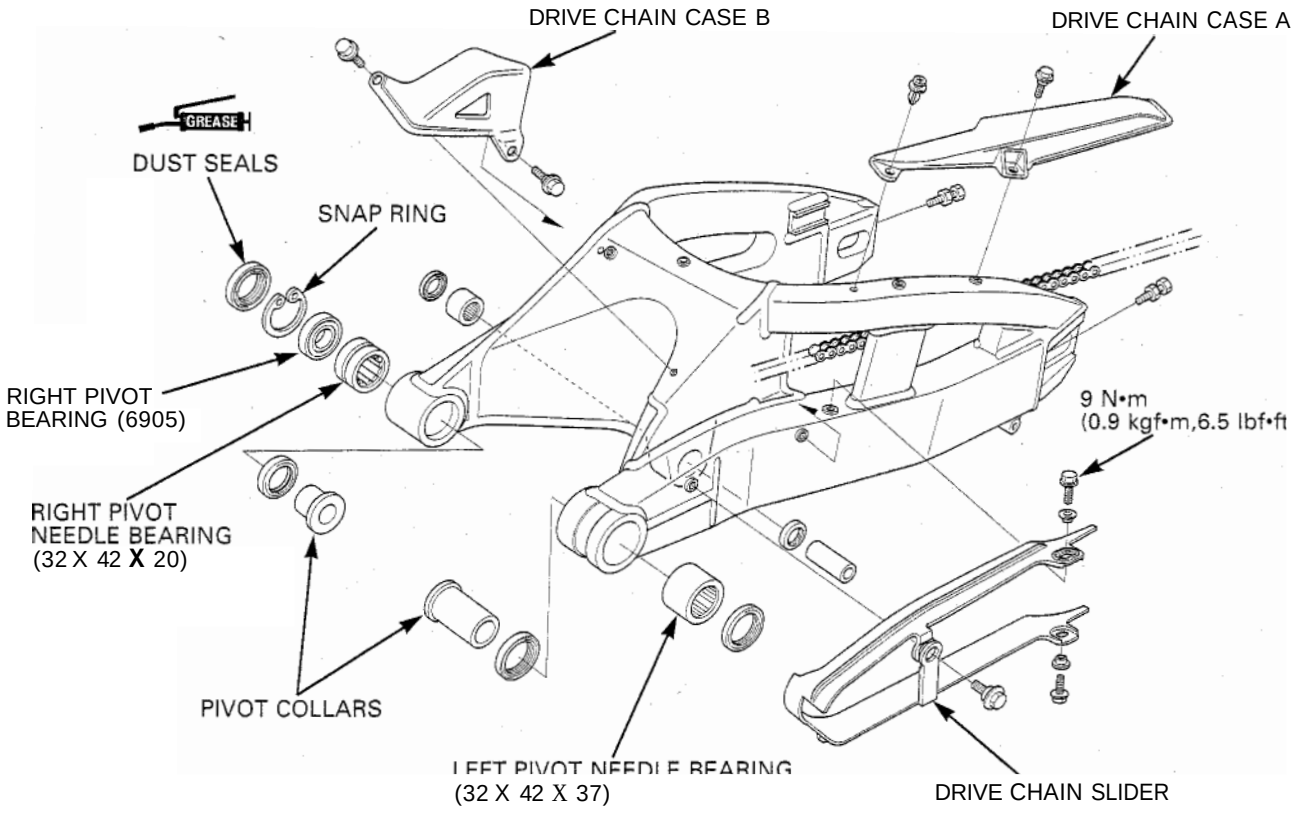
TOOL:
Needle bearing remover **07LMC–KV30100**



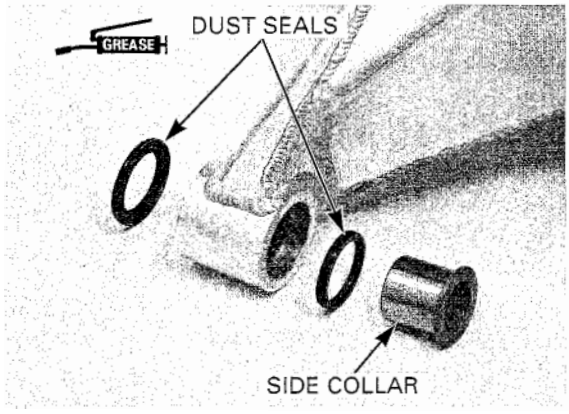
Apply grease to the dust seal lips, then install the dust seals and pivot collar into the swingarm.



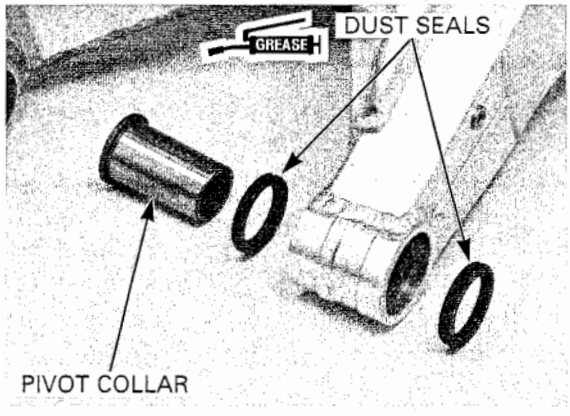
ASSEMBLY



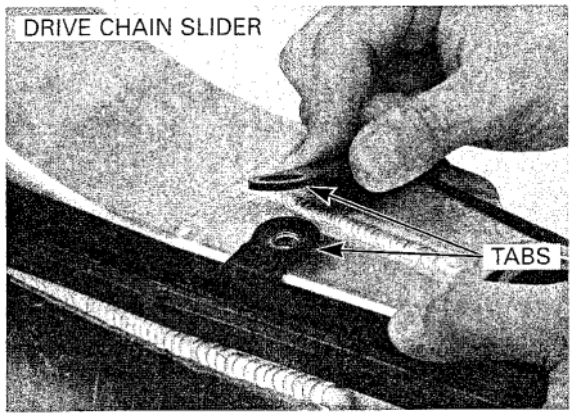
Apply grease to the dust seal lips, then install the dust seals and side collar into the right swingarm pivot.



Apply grease to the dust seal lips, then install the dust seals and pivot collar into the left swingarm pivot.

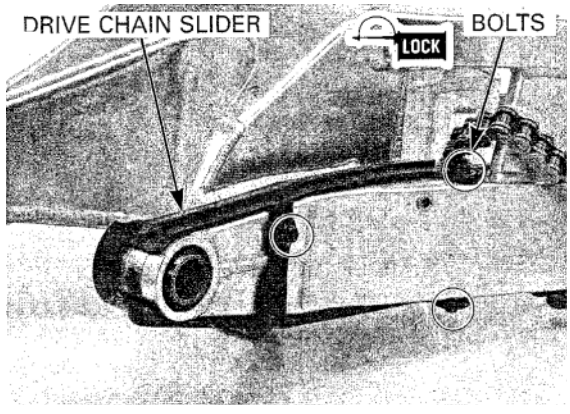


Install the drive chain slider aligning its tabs with the boss on the swingarm as shown.

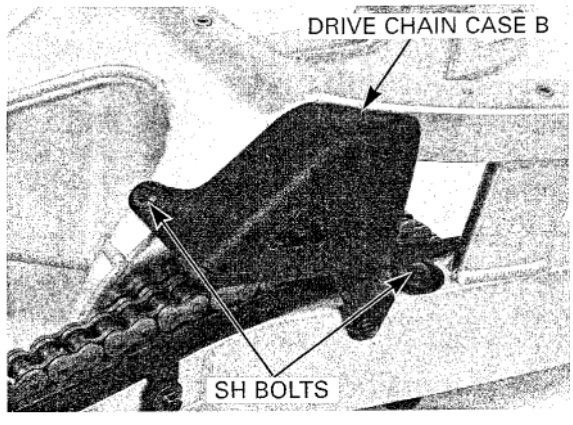


Apply a locking agent to the drive chain slider bolt threads.
Install the collars and bolts, then tighten the bolts to the specified torque.

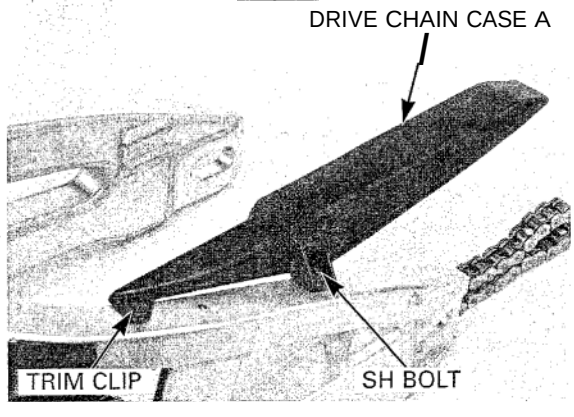
TORQUE: 9 N·m (0.9 kgf·m, 6.5 lbf·ft)



Install drive chain case B and tighten the SH bolt securely.

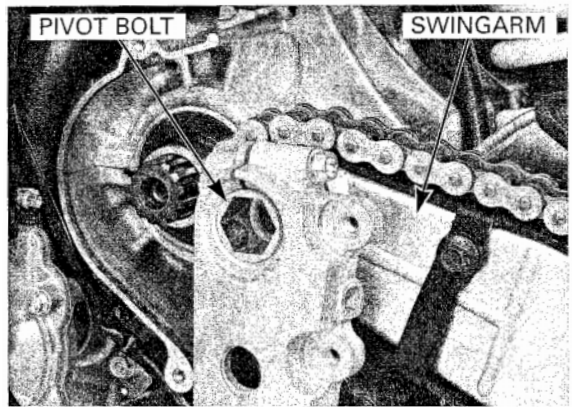


Install drive chain case A and secure it with a SH bolt and trim clip.



INSTALLATION

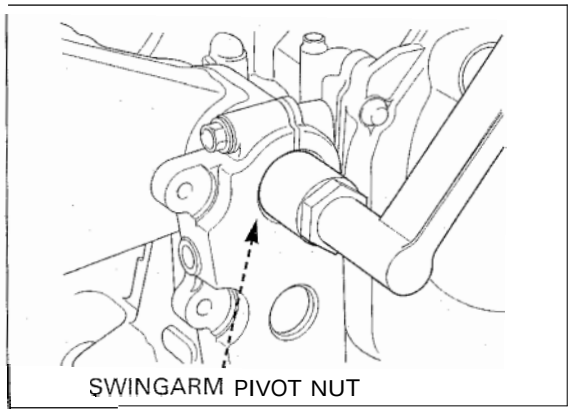
Apply a thin coat of grease to the swingarm pivot bolt surface.
Install the swingarm between the lower bracket and engine, then install the pivot bolt from the left side.



Install the swingarm pivot nut.
Hold the pivot bolt using a special tool, tighten the swingarm pivot nut to the specified torque using the same tool.

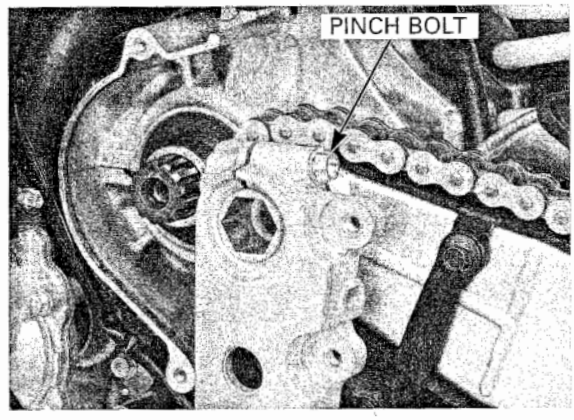
TOOL:
Rod holder, 24 X 27 mm **07930–KA50100**

TORQUE: 118 N·m (12.0 kgf·m, 87 lbf·ft)



Tighten the swingarm pivot pinch bolts to the specified torque.

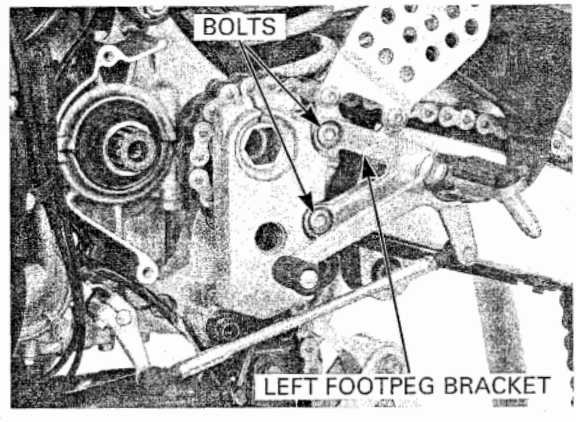
TORQUE: 26 N·m (2.7 kgf·m, 20 lbf·ft)



Install the left main footpeg bracket onto the lower bracket and tighten the socket bolts to the specified torque.

TORQUE: 39 N·m (4.0 kgf-m, 29 lbf·ft)

Install the gearshift pedal link (page 9-17).

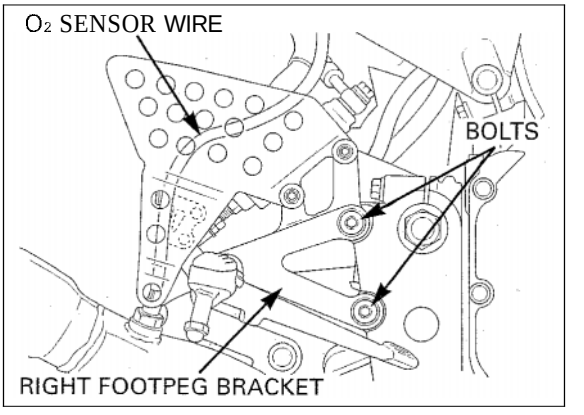


California type only

Clamp the O_2 sensor wire to the wire guide behind the right step guard.

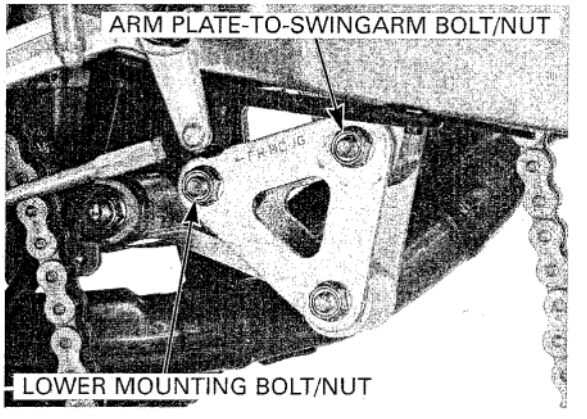
Install the right main footpeg bracket onto the lower bracket and tighten the socket bolts to the specified torque.

TORQUE: 39 N•m (4.0 kgf•m, 29 lbf•ft)



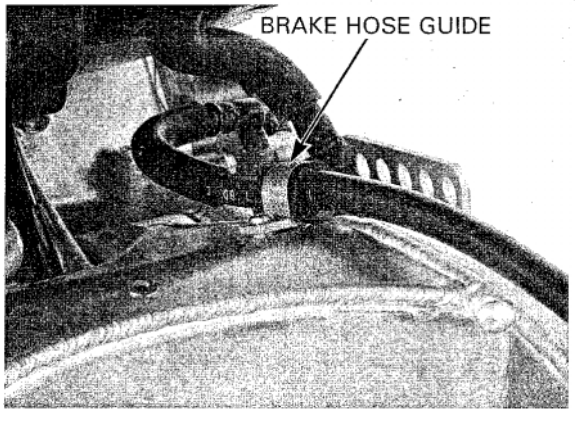
Install the shock arm plate-to-swingarm bolt/nut, then tighten the nut to the specified torque.

TORQUE: 44 N•m (4.5 kgf•m, 33 lbf•ft)



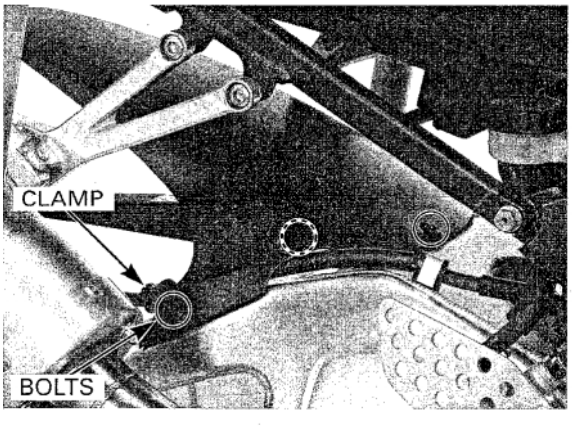
Install the brake hose guide and tighten the screw to the specified torque.

TORQUE: 4 N•m (0.4 kgf•m, 2.9 lbf•ft)



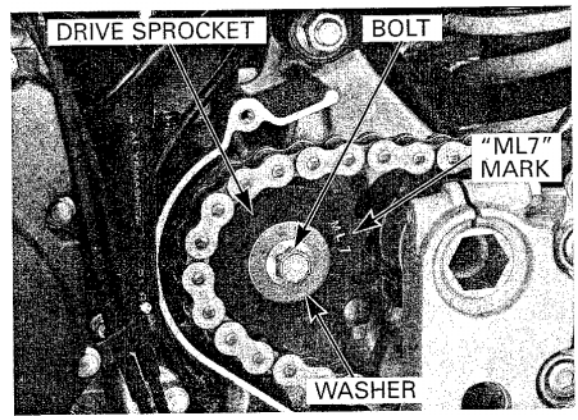
Tighten the right rear mounting bolt with a brake hose clamp

Install the inner fender and tighten the mounting bolts.



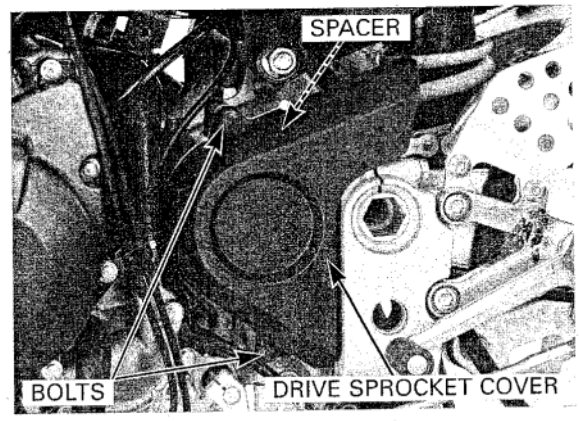
Install the drive sprocket with its "ML7" mark facing out.
Install the washer and special bolt, then tighten the bolt to the specified torque.

TORQUE: 54 N·m (5.5 kgf·m, 40 lbf·ft)

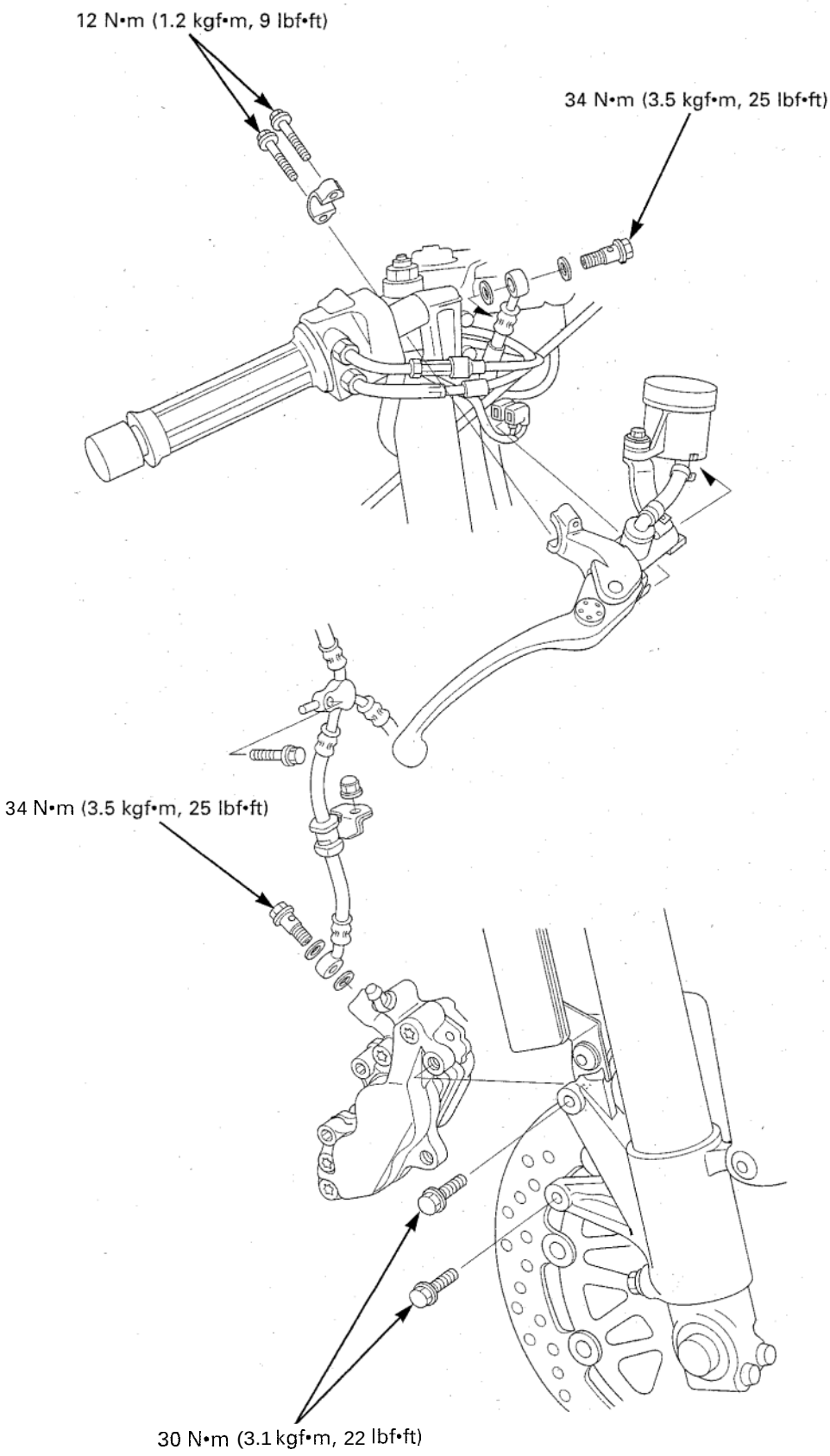


Install the spacer and drive sprocket cover, tighten the SH bolts.

Install the rear wheel (page 14-8).
Install the removed parts in the reverse order of removal.



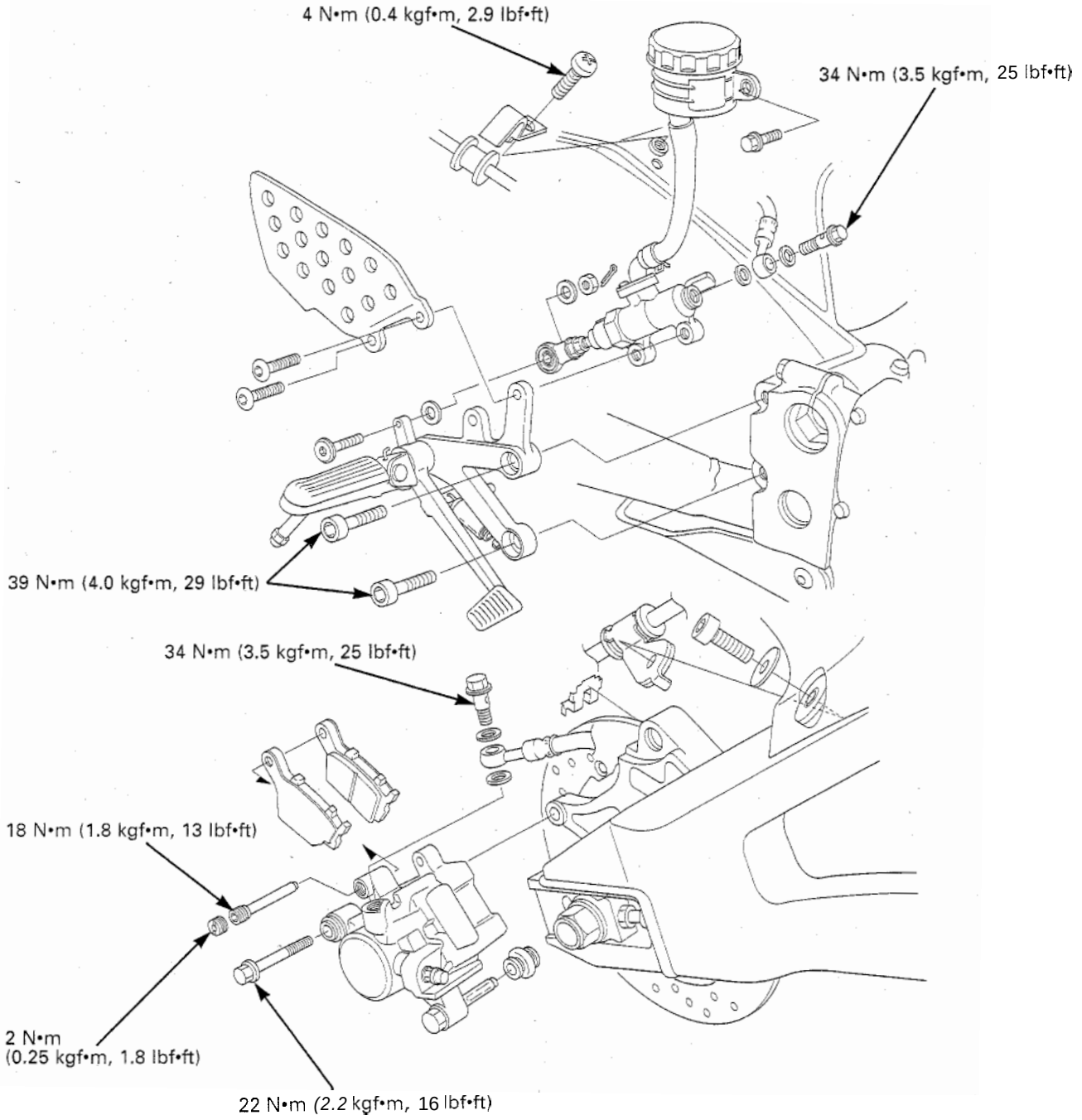
FRONT:


12 N•m (1.2 kgf•m, 9 lbf•ft)
34 N•m (3.5 kgf•m, 25 lbf•ft)
34 N•m (3.5 kgf•m, 25 lbf•ft)
30 N•m (3.1 kgf•m, 22 lbf•ft)

15. HYDRAULIC BRAKE

SERVICE INFORMATION	15-2	REAR MASTER CYLINDER	15-17
TROUBLESHOOTING	15-3	FRONT BRAKE CALIPER	15-21
BRAKE FLUID REPLACEMENT/ AIR BLEEDING	15-4	REAR BRAKE CALIPER	15-25
BRAKE PAD/DISC	15-8	BRAKE PEDAL	15-28
FRONT MASTER CYLINDER	15-12		

REAR:



SERVICE INFORMATION

GENERAL

⚠ CAUTION

Frequent inhalation of brake pad dust, regardless of material composition could be hazardous to your health.
- Avoid breathing dust particles.
- Never use an air hose or brush to clean brake assemblies. Use an OSHA-approved vacuum cleaner.

- A contaminated brake disc or pad reduces stopping power. Discard contaminated pads and clean a contaminated disc with a high quality brake degreasing agent.
- Check the brake system by applying the brake lever or pedal after the air bleeding.
- Spilled brake fluid will severely damage instrument lenses and painted surfaces. It is also harmful to some rubber parts. Be careful whenever you remove the reservoir cap; make sure the front reservoir is horizontal first.
- Never allow contaminates (dirt, water, etc.) to get into an open reservoir.
- Once the hydraulic system has been opened, or if the brake feels spongy, the system must be bled.
- Always use fresh DOT 4 brake fluid from a sealed container when servicing the system. Do not mix different types of fluid they may not be compatible.
- Always check brake operation before riding the motorcycle.

SPECIFICATIONS

Unit: mm (in)

ITEM			STANDARD	SERVICE LIMIT
Front	Specified brake fluid		Honda DOT 4 Brake Fluid	—
	Brake disc thickness		4.5 (0.18)	3.5 (0.14)
	Brake disc runout		—	0.30 (0.012)
	Master cylinder I.D.		17.460 – 17.503 (0.6874 – 0.6891)	17.515 (0.6896)
	Master piston O.D.		17.321 – 17.367 (0.6819 – 0.6837)	17.309 (0.6815)
	Caliper cylinder I.D.	Upper (Cylinder A)	32.025 – 32.035 (1.2608 – 1.2612)	32.05 (1.262)
		Lower (Cylinder B)	30.250 – 30.280 (1.1909 – 1.1921)	30.29 (1.193)
	Caliper piston O.D.	Upper (Piston A)	31.965 – 31.998 (1.2585 – 1.2598)	31.953 (1.2580)
		Lower (Piston B)	30.082 – 30.115 (1.1843 – 1.1856)	30.074 (1.1840)
Rear	Specified brake fluid		Honda DOT 4 Brake Fluid	—
	Brake disc thickness		5.0 (0.20)	4.0 (0.16)
	Brake disc runout		—	0.30 (0.012)
	Master cylinder I.D.		15.870 – 15.913 (0.6248 – 0.6265)	15.925 (0.6270)
	Master piston O.D.		15.827 – 15.854 (0.6231 – 0.6242)	15.815 (0.6226)
	Caliper cylinder I.D.		38.180 – 38.230 (1.5031 – 1.5051)	38.24 (1.506)
	Caliper cylinder O.D.		38.098 – 38.148 (1.4999 – 1.5019)	38.090 (1.4996)

TORQUE VALUES

Front brake master cylinder cup mounting nut	6 N•m (0.6 kgf-m, 4.3 lbf•ft)	U-nut
Front master cylinder bracket bolt	12 N•m (1.2 kgf•m, 9 lbf•ft)	
Brake lever pivot bolt	10 N•m (1.0 kgf•m, 7 lbf•ft)	
Brake lever pivot nut	6 N•m (0.6 kgf•m, 4.3 lbf•ft)	
Front brake light switch screw	1 N•m (0.12 kgf-m, 0.9 lbf•ft)	
Front brake caliper mounting bolt	30 N•m (3.1 kgf•m, 22 lbf•ft)	ALOC bolt
Caliper body assembly torx bolt	23 N•m (2.3 kgf•m, 17 lbf•ft)	ALOC bolt
Pad pin	18 N•m (1.8 kgf•m, 13 lbf•ft)	
Pad pin plug	2 N•m (0.25 kgf-m, 1.8 lbf•ft)	
Brake caliper bleed valve	6 N•m (0.6 kgf-m, 4.3 lbf•ft)	
Rear brake hose clamp screw	4 N•m (0.4 kgf•m, 2.9 lbf•ft)	ALOC bolt
Rear master cylinder push rod nut	18 N•m (1.8 kgf-m, 13 lbf•ft)	
Rear master cylinder hose joint screw	1 N•m (0.15 kgf•m, 1.1 lbf•ft)	Apply a locking agent to the threads.
Rear brake caliper mounting bolt	27 N•m (2.8 kgf-m, 20 lbf•ft)	Apply a locking agent to the threads.
Rear brake caliper slide pin bolt	22 N•m (2.2 kgf-m, 16 lbf•ft)	Apply a locking agent to the threads.
Brake hose oil bolt	34 N•m (3.5 kgf-m, 25 lbf•ft)	
Main footpeg bracket socket bolt	39 N•m (4.0 kgf-m, 29 lbf•ft)	
Main footpeg mounting bolt	44 N•m (4.5 kgf-m, 33 lbf•ft)	ALOC bolt

TOOL

Snap ring pliers	07914–SA50001

TROUBLESHOOTING

Brake lever/pedal soft or spongy
- Air in hydraulic system
- Leaking hydraulic system
- Contaminated brake pad/disc
- Worn caliper piston seal
- Worn master cylinder piston cups
- Worn brake pad/disc
- Contaminated caliper
- Caliper not sliding properly (rear)
- Low brake fluid level
- Clogged fluid passage
- Warped/deformed brake disc
- Sticking/worn caliper piston
- Sticking/worn master cylinder piston
- Contaminated master cylinder
- Bent brake lever/pedal

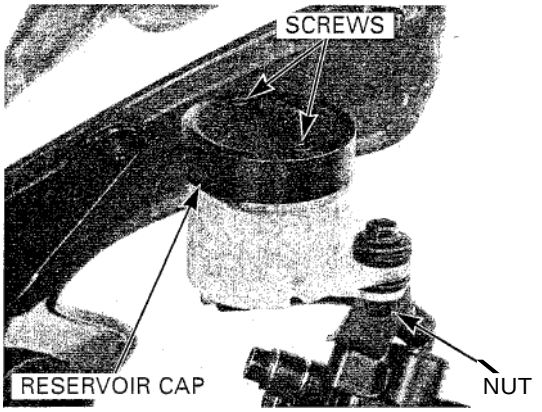
Brake lever/pedal hard
- Clogged/restricted brake system
- Sticking/worn caliper piston
- Caliper not sliding properly (rear)
- Clogged/restricted fluid passage
- Worn caliper piston seal
- Sticking/worn master cylinder piston
- Bent brake lever/pedal

Brake drags
- Contaminated brake pad/disc
- Misaligned wheel
- Clogged/restricted brake hose joint
- Warped/deformed brake disc
- Caliper not sliding properly (rear)
- Clogged/restricted brake hydraulic system
- Sticking/worn caliper piston
- Clogged master cylinder port

BRAKE FLUID REPLACEMENT/AIR BLEEDING

NOTICE

- *Do not allow foreign material to enter the system when filling the reservoir,*
- *Avoid spilling fluid on painted, plastic, or rubber parts. Place a rag over these parts whenever the system is serviced.*

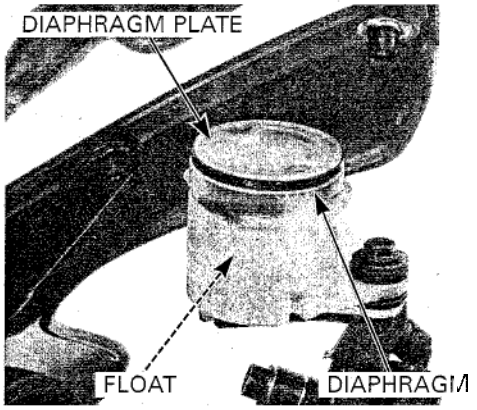


BRAKE FLUID DRAINING

For the front brake, turn the handlebar until the reservoir is parallel to the ground, before removing the reservoir cap.

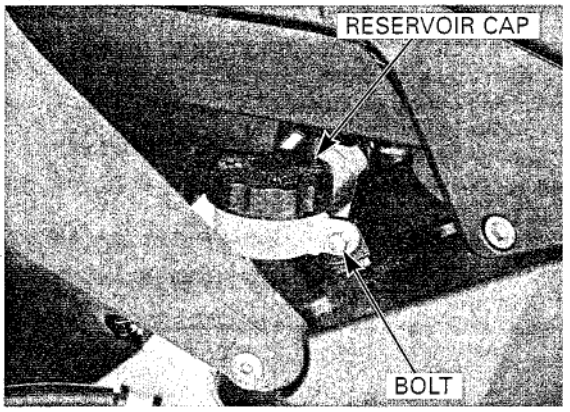
Loosen the master cylinder reservoir mounting nut. Remove the screws and reservoir cap.

Remove the diaphragm plate, diaphragm and float.

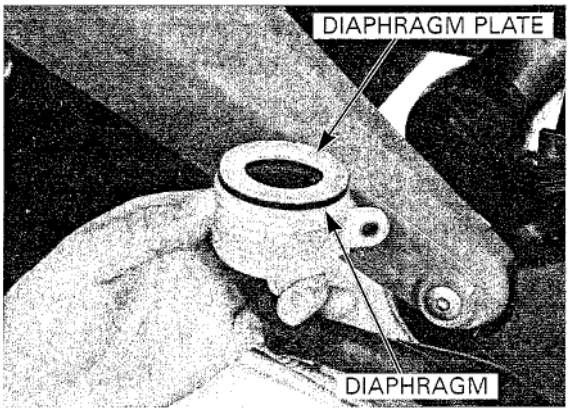


For the rear brake, remove the rear brake reservoir mounting bolt.

Remove the reservoir cap.

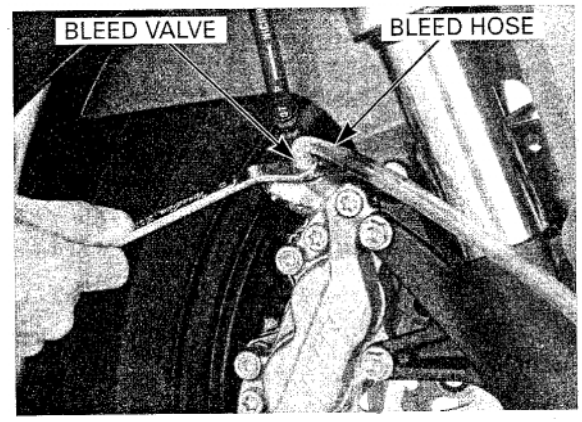


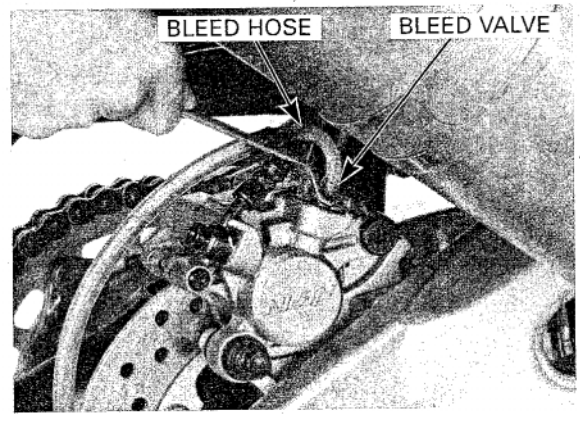
Remove the diaphragm plate and diaphragm.



Connect a bleed hose to the caliper bleed valve.

Loosen the bleed valve and pump the brake lever or pedal.
Stop pumping the lever or pedal when no more fluid flows out of the bleed valve.

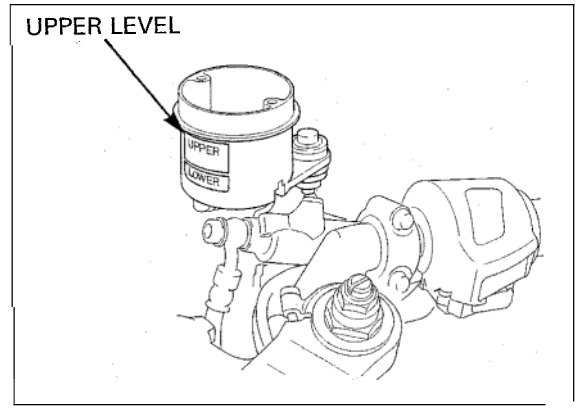


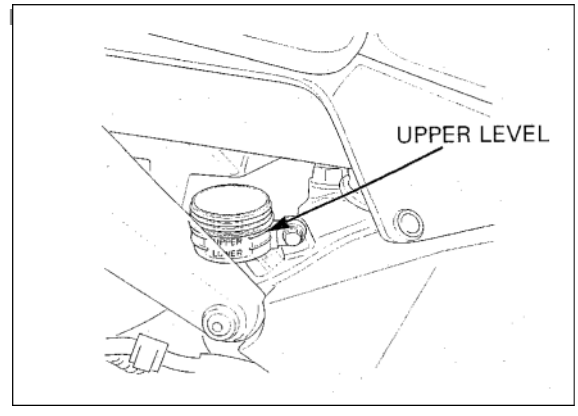


BRAKE FLUID FILLING/AIR BLEEDING

Fill the reservoir with DOT 4 brake fluid from a sealed container.

NOTE:
- Use only DOT 4 brake fluid from a sealed container.
- Do not mix different types of fluid. They are not compatible.



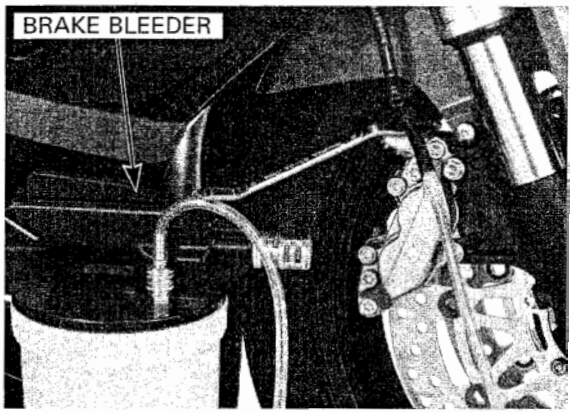


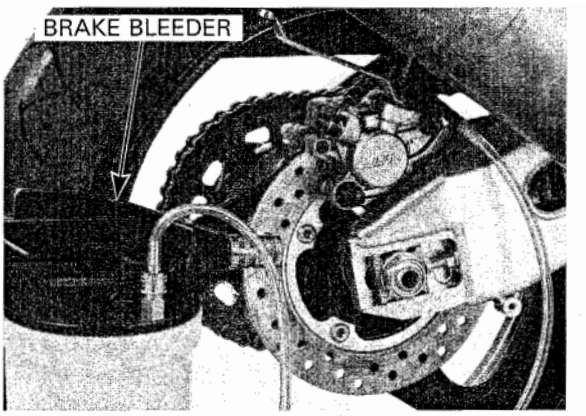
Connect a commercially available brake bleeder to the bleed valve.

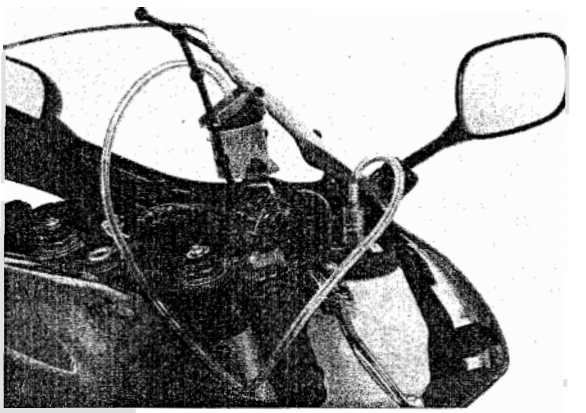
Operate the brake bleeder and loosen the bleed valve.

If an automatic refill system is not used, add fluid when the fluid level in the reservoir is low.
Perform the bleeding procedure until the system is completely flushed/bled.

Close the bleed valve and operate the brake lever or pedal. If it still feels spongy, bleed the system again.







If the brake bleeder is not available, perform the following procedure.

Pressurize the system with the lever or pedal until there are no air bubbles in the fluid flowing out of the reservoir small hole and lever resistance is felt.

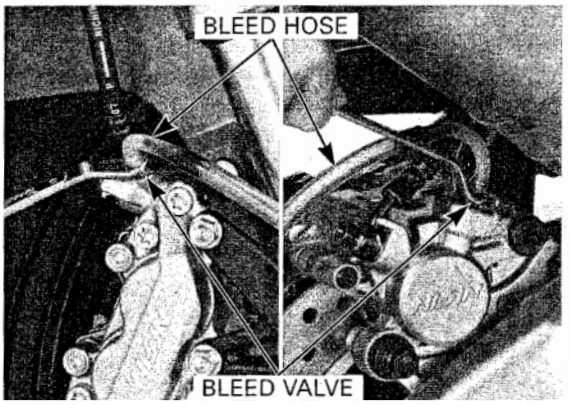
Do not release the brake lever or pedai until the bleed vaive has been closed

1. Squeeze the brake lever or push the brake pedal, open the bleed valve 1/2 turn and then close the valve.

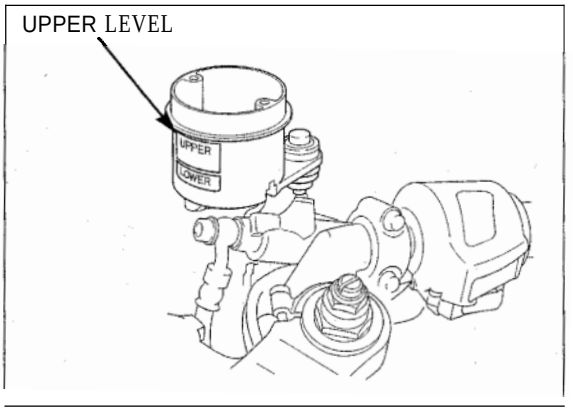
2. Release the brake lever or pedal until the bleed valve has been closed.

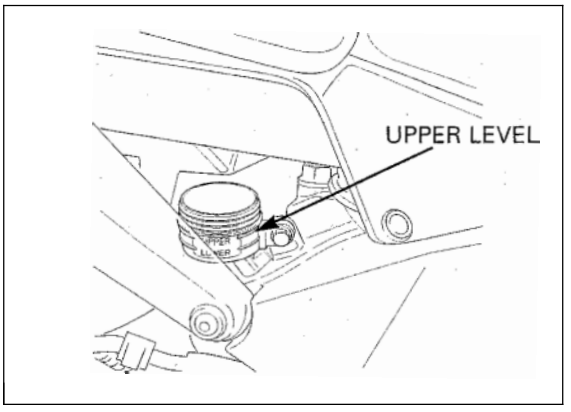
Repeat steps 1 and 2 until bubbles cease to appear in the fluid coming out of the bleed valve.
Tighten the bleed valve.

TORQUE: 6 N·m (0.6 kgf·m, 4.3 lbf·ft)

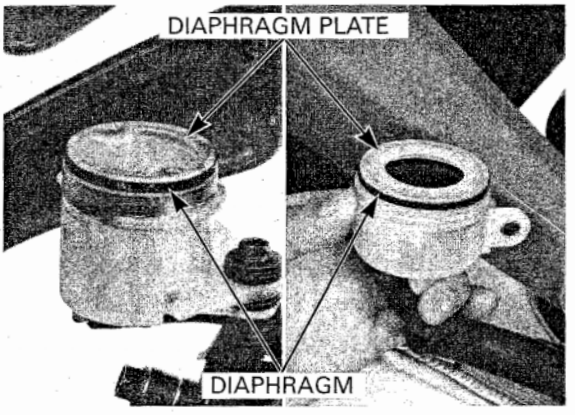


Fill the fluid reservoir to the upper level.

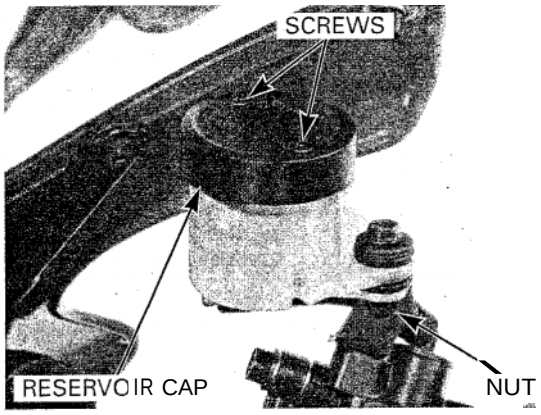




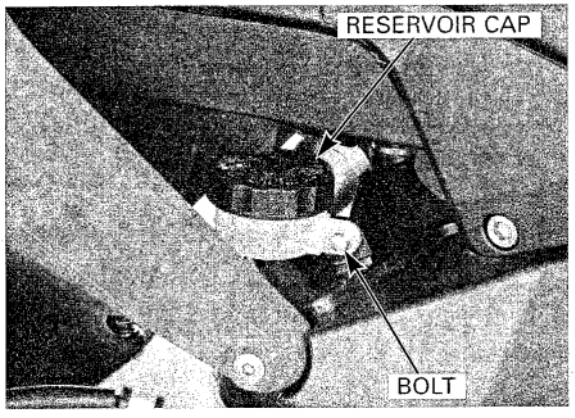
Reinstall the diaphragm and diaphragm plate.



On the front brake, install the reservoir cap, and tighten the screws.
Tighten the master cylinder reservoir mounting nut securely.



On the rear brake, install the reservoir cap securely, then install the reservoir onto the frame and tighten the mounting bolt.

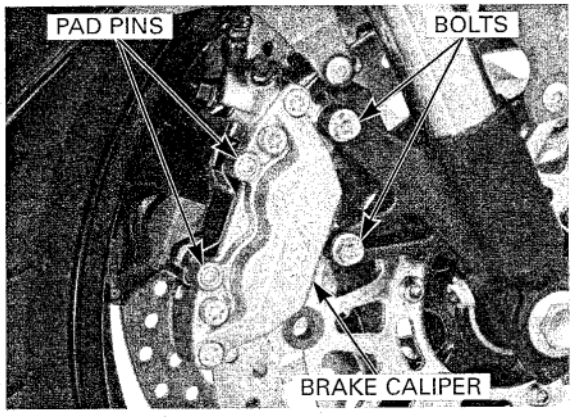


BRAKE PAD/DISC

FRONT BRAKE PAD REPLACEMENT

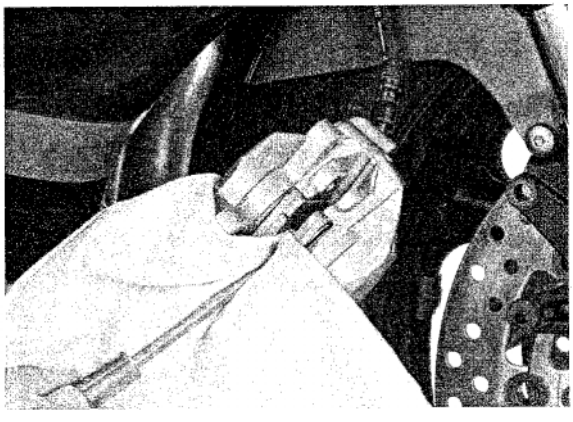
Always replace the brake pads in pairs to assure even disc pressure

Loosen the pad pins.
Remove the bolts and brake caliper.

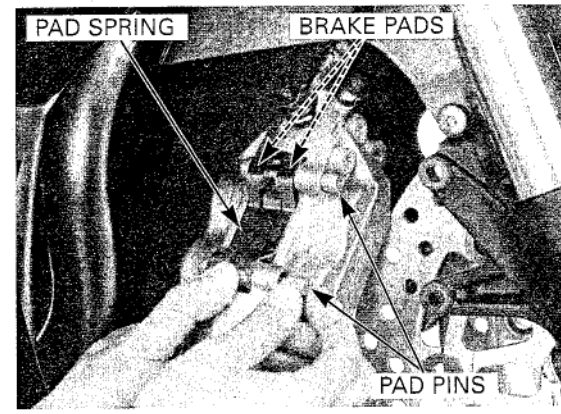


Check the biake fluid level in the brake master cylinder reservoir as this opeiation causes the level to rise

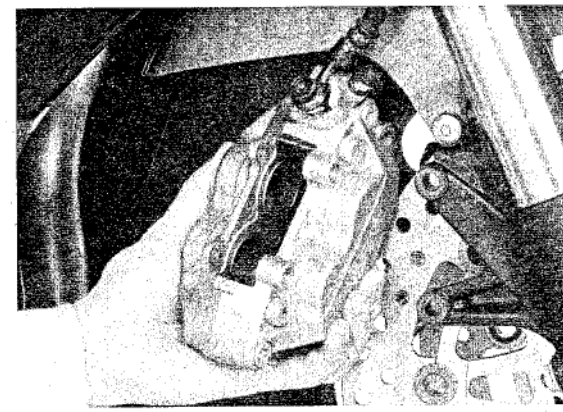
Pus the caliper pistons all the way in o allow installation of new brake pads.



Remove the pad pins, pad spring and brake pads.

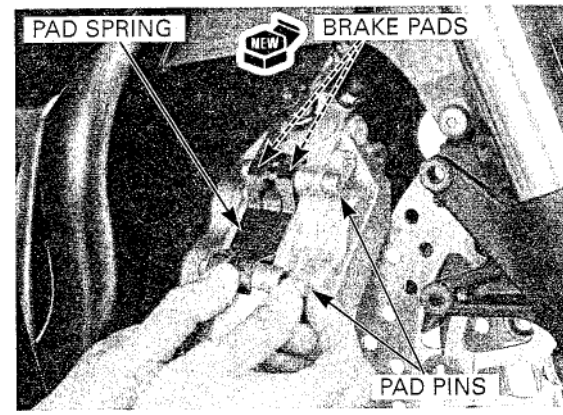


Clean the inside of the caliper especially around the caliper pistons.



Install the new brake pads.
Install the pad spring with its arrow mark facing up (page 15-23).

Push the pad spring, then install the pad pin.



Be careful not to damage the pads.

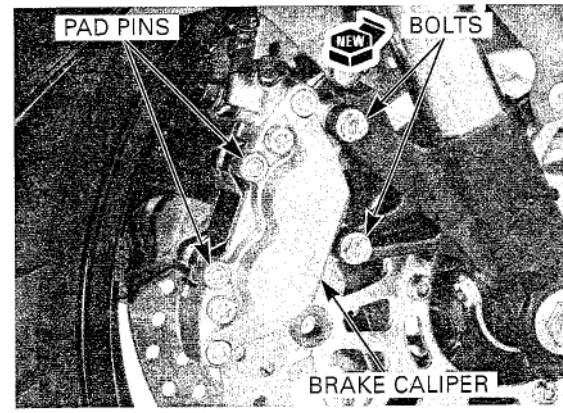
Install the brake caliper to the fork leg so the disc is positioned between the pads.

Install and tighten the new brake caliper mounting bolts.

TORQUE: 30 N·m (3.1 kgf·m, 22 lbf·ft)

Tighten the pad pins.

TORQUE: **18 N·m (1.8 kgf·m, 13 lbf·ft)**

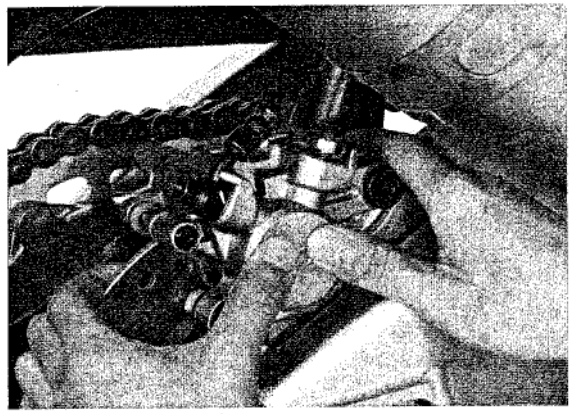


REAR BRAKE PAD REPLACEMENT

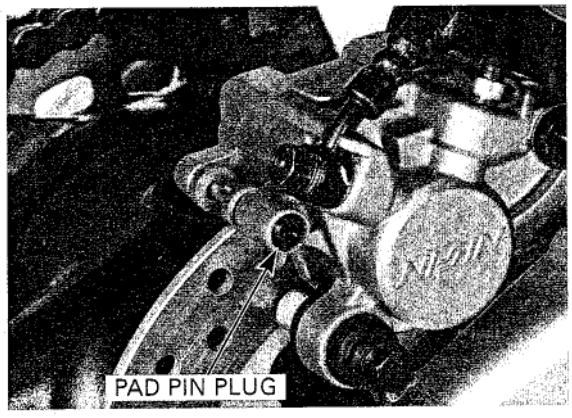
Always replace the brake pads in pairs to assure even disc pressure

Check the brake fluid level in the brake master cylinder reservoir as this operation causes the level to rise.

Push the caliper pistons all the way in by pushing the caliper body inward to allow installation of new brake pads.

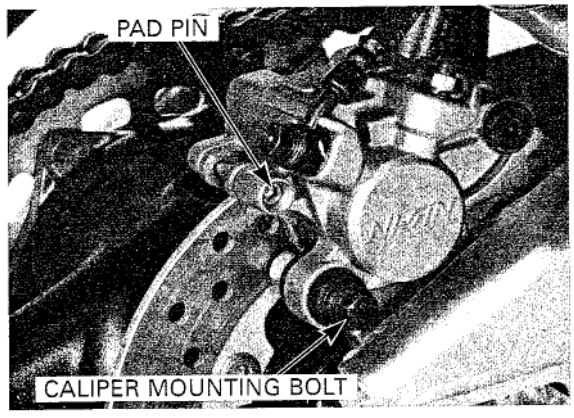


Remove the pad pin plug.

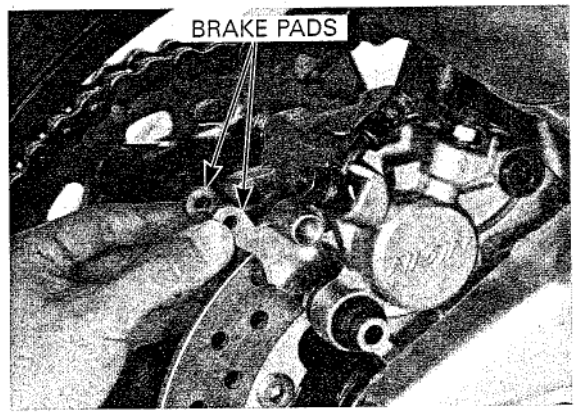


Loosen the pad pin.

Remove the caliper mounting bolt.



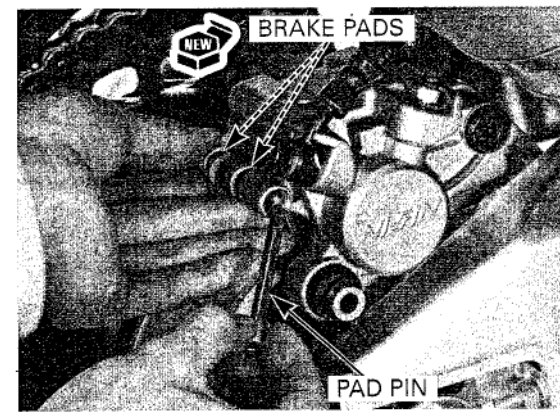
Pivot the caliper up.
Remove the pad pin and brake pads.



Make sure the brake pad spring is in place.
Install the new brake Dads.

Lower the caliper while pushing the pads against the pad spring so the pad ends are positioned onto the retainer on the caliper bracket.

Install the pad pin.

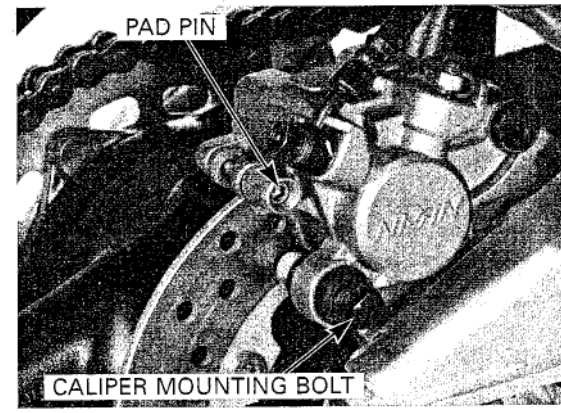


Install and tighten the caliper mounting bolt.

TORQUE: 22 N•m (2.2 kgf•m, 16 lbf•ft)

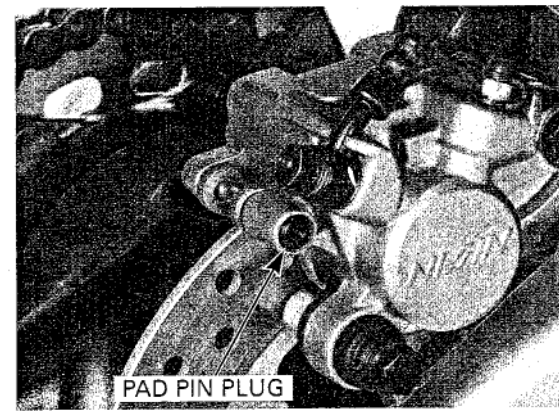
Tighten the pad pin.

TORQUE: 18 N•m (1.8 kgf•m, 13 lbf•ft)



Install and tighten the pad pin plug.

TORQUE: 2 N•m (0.25 kgf-m, 1.8 lbf•ft)



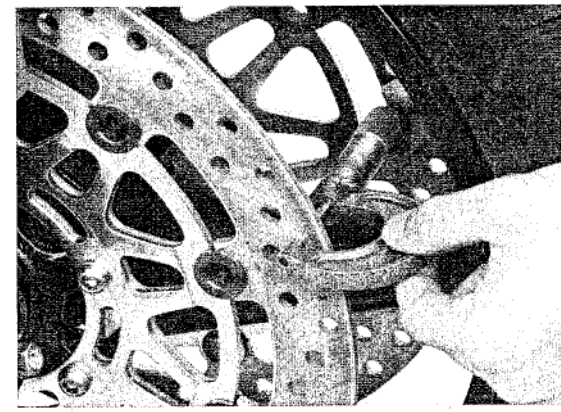
BRAKE DISC INSPECTION

Visually inspect the brake disc for damage or crack.

Measure the brake disc thickness with a micrometer.

SERVICE LIMITS:
FRONT: 3.5 mm (0.14 in)
REAR: 4.0 mm (0.16 in)

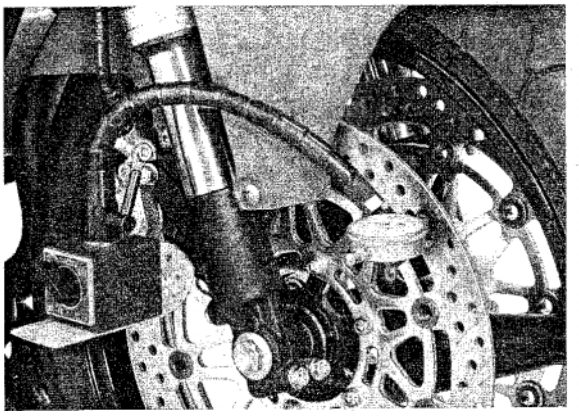
Replace the brake disc if the smallest measurement is less than the service limit.



Measure the brake disc warpage with a dial indicator.

SERVICE LIMIT: 0.30 mm (0.012 in)

Check the wheel bearings for excessive play, if the warpage exceeds the service limit.
Replace the brake disc if the wheel bearings are normal.



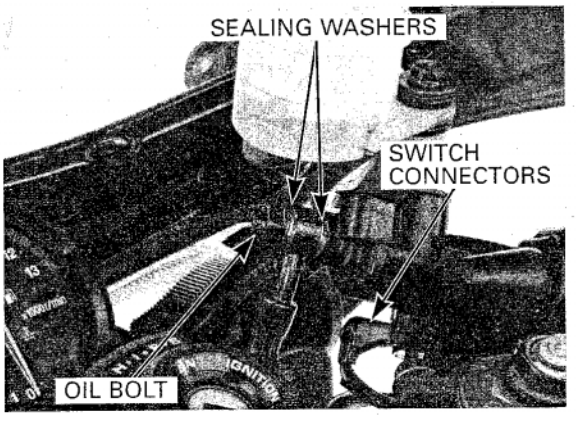
FRONT MASTER CYLINDER

REMOVAL

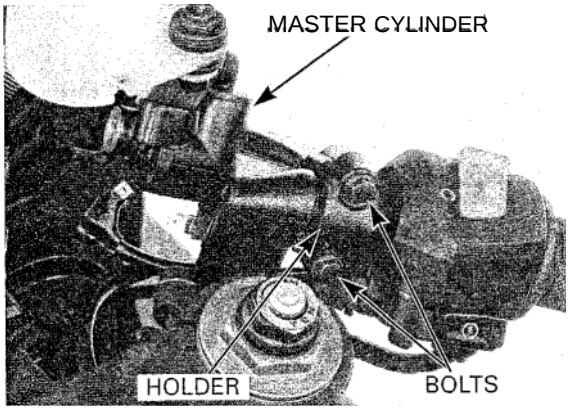
Drain the front hydraulic system (page 15-4).

Avoid spilling fluid on painted, plastic, or rubber parts Place a rag over these parts whenever the system is serviced

Disconnect the brake light switch wire connectors.
Remove the brake hose oil bolt, sealing washers and brake hose eyelet.



Remove the bolts from the master cylinder holder and remove the master cylinder assembly.



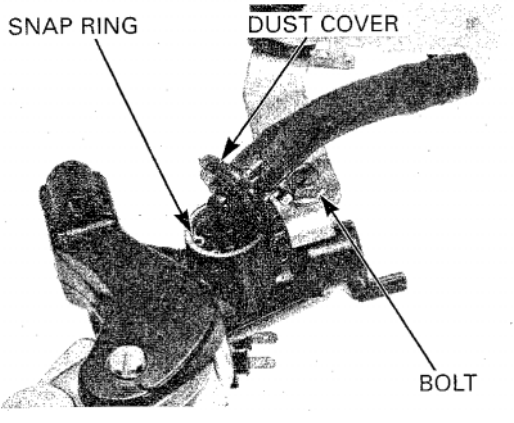
DISASSEMBLY

Remove the dust cover and snap ring.

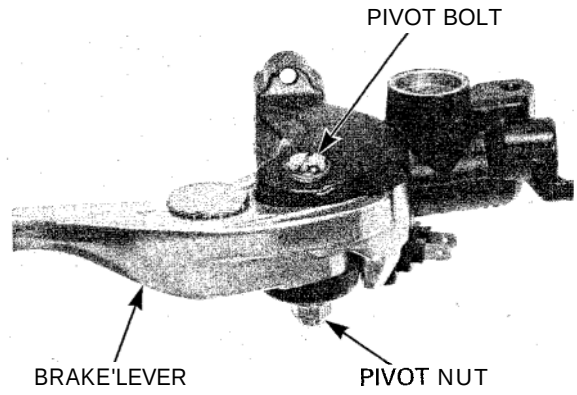
TOOL:
Snap ring pliers **07914–SA50000**

Remove the bolt and brake reservoir from the master cylinder.

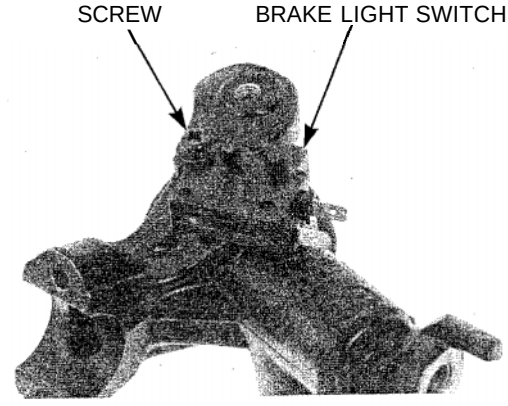
Remove the O-ring.



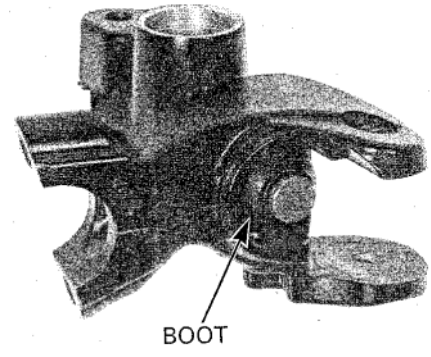
Remove the pivot bolt/nut and brake lever assembly.



Remove the screw and brake light switch.



Remove the boot.

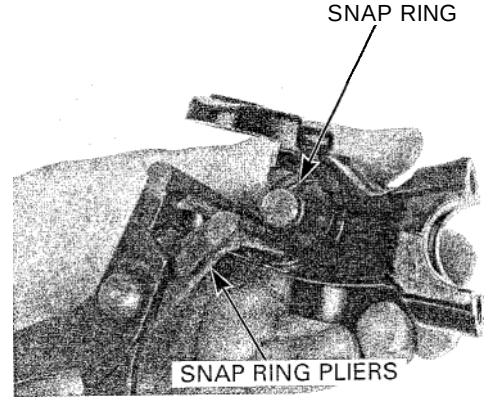


Remove the snap ring from the master cylinder body using the special tool as shown.

TOOL:
Snap ring pliers **07914–SA50000**

Remove the master piston and spring.

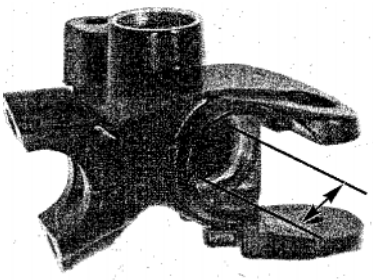
Clean the inside of the cylinder and reservoir with brake fluid.



INSPECTION

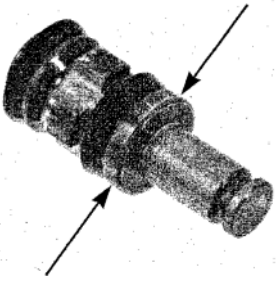
Check the piston boot, primary cup and secondary cup for fatigue or damage.
Check the master cylinder and piston for abnormal scratches.
Measure the master cylinder I.D.

SERVICE LIMIT: 17.515 mm (0.6896 in)

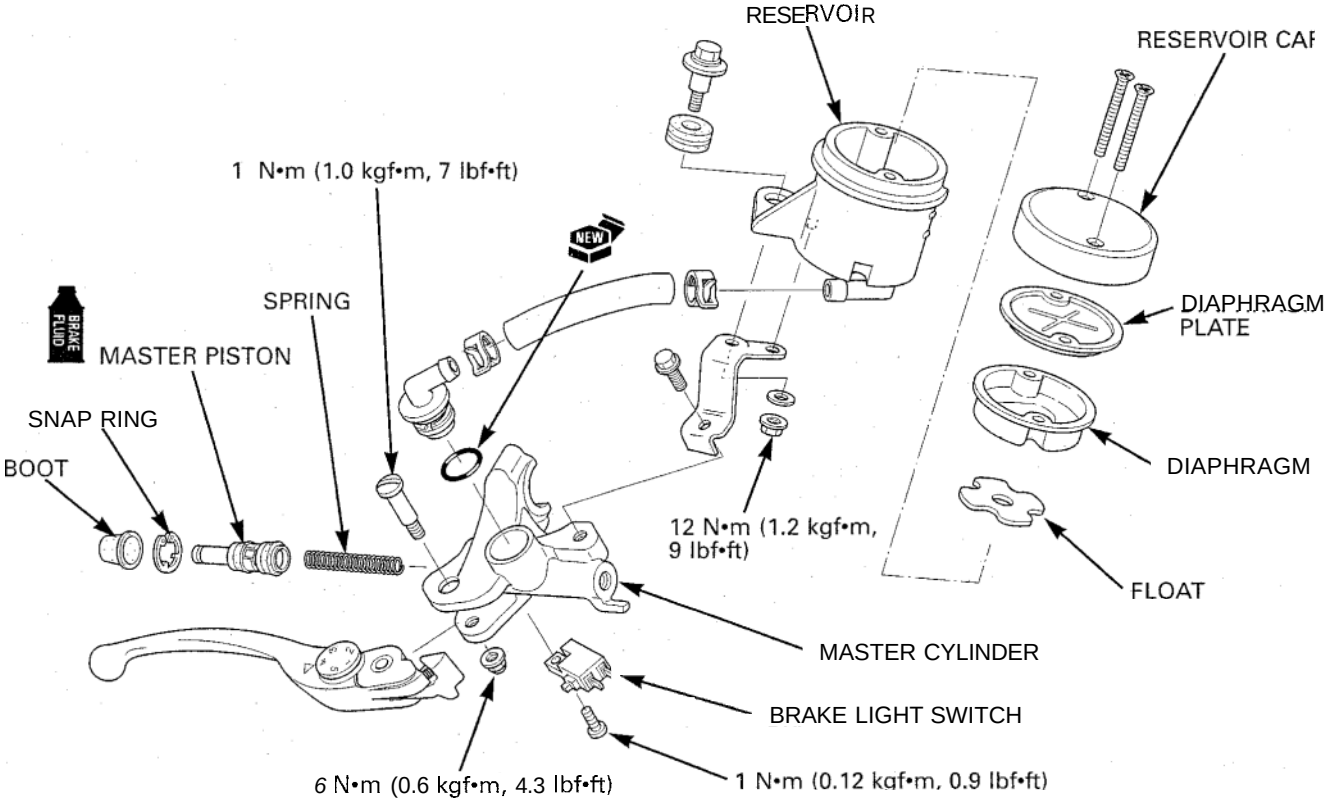


Measure the master cylinder piston O.D.

SERVICE LIMIT: 17.309 mm (0.6815 in)

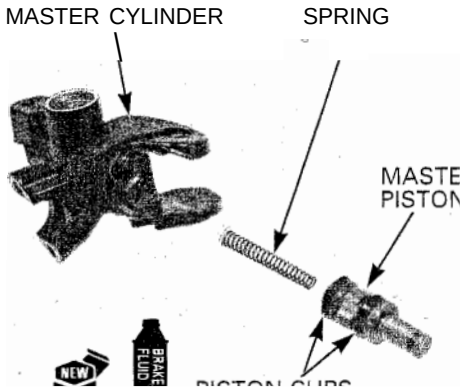


ASSEMBLY



Keep the piston, cups, spring, snap ring and boot as a set do not substitute individual parts

Coat all parts with clean brake fluid before assembly.



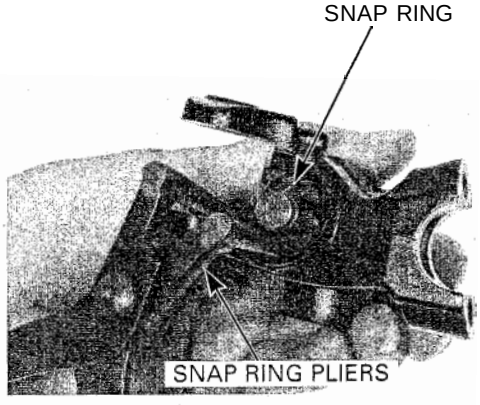
When installing the cups, do not allow the lips to turn inside out

Dip the piston in brake fluid.
Install the spring into the piston.
Install the piston assembly into the master cylinder.

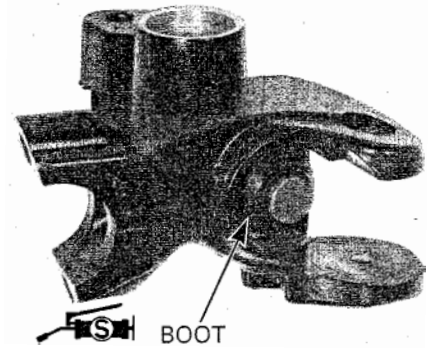
Be certain the snap ring is firmly seated in the groove

Install the snap ring.

TOOL:
Snap ring pliers **07914–SA50000**

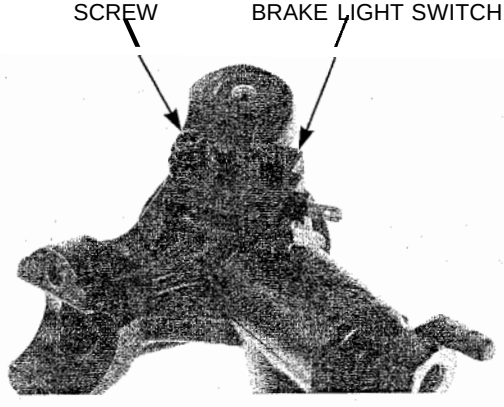


Install the boot.

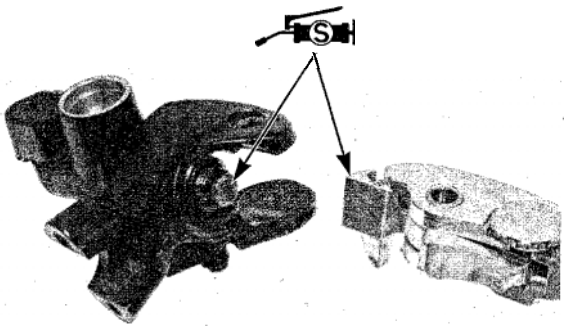


Install the brake light switch and tighten the screw to the specified torque.

TORQUE: 1 N•m (0.12 kgf•m, 0.9 lbf•ft)



Apply silicone grease to the contact surfaces of the brake lever and piston tip.

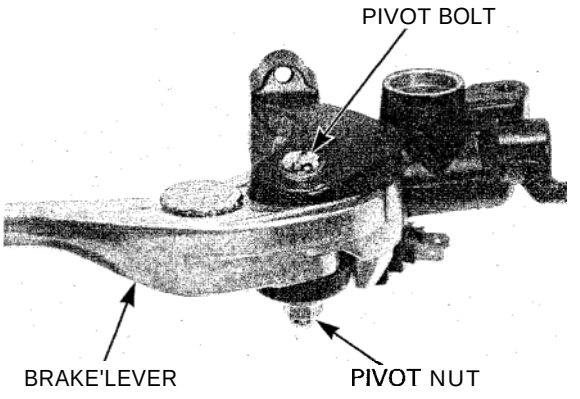


Install the brake lever assembly, tighten the pivot bolt to the specified torque.

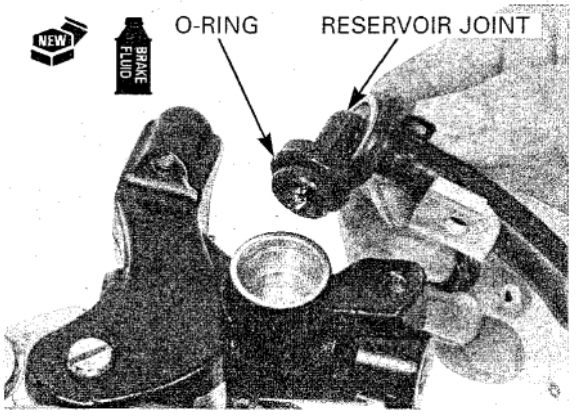
TORQUE: 10 N•m (1.0 kgf•m, 7 lbf•ft)

Hold the pivot bolt and tighten the pivot nut to the specified torque.

TORQUE: 6 N•m (0.6 kgf•m, 4.3 lbf•ft)



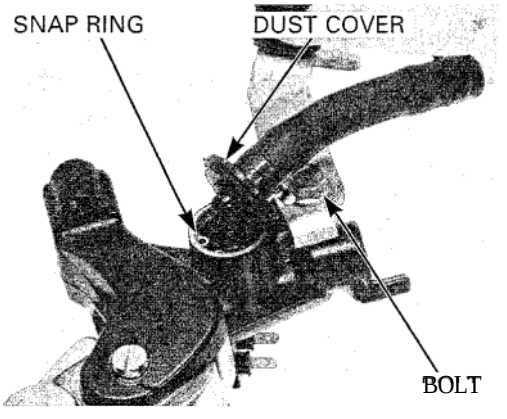
Apply brake fluid to the new reservoir joint O-ring.



Install the master cylinder reservoir joint into the master cylinder and secure the joint with a snap ring.

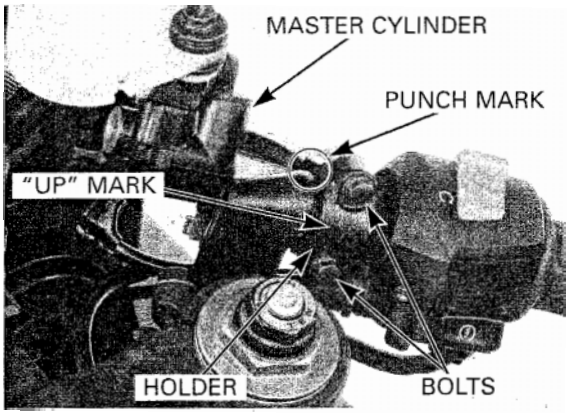
TOOL:
Snap ring pliers **07914–SA50000**

Install the dust cover.
Install and tighten the reservoir mounting bolt.



Place the master cylinder assembly on the handlebar. Align the end of the master cylinder with the punch mark on the handlebar.

Install the master cylinder holder with the "UP" mark facing up.
Tighten the upper bolt first, then the lower bolt.

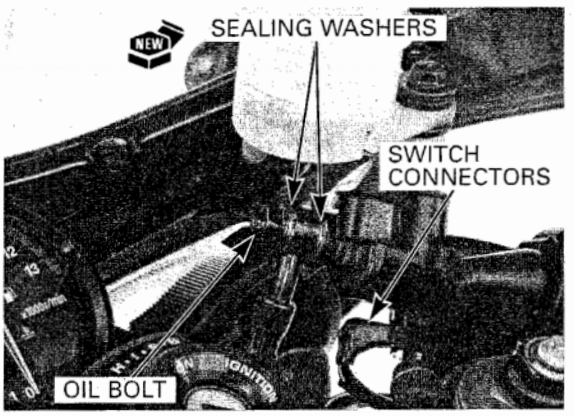


Install the brake hose eyelet with the oil bolt and new sealing washers.
Push the eyelet joint against the stopper, then tighten the oil bolt to the specified torque.

TORQUE: 34 N•m (3.5 kgf•m, 25 lbf•ft)

Connect the brake light switch wire connectors.

Fill the reservoir to the upper level and bleed the brake system (page 15-5).

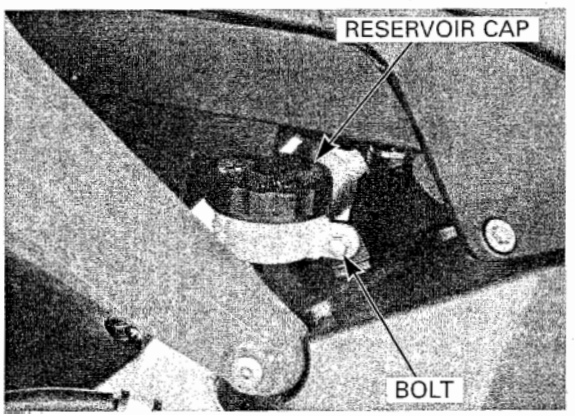


REAR MASTER CYLINDER

REMOVAL

Drain the rear hydraulic system (page 15-4).

Remove the rear master cylinder reservoir mounting bolt.



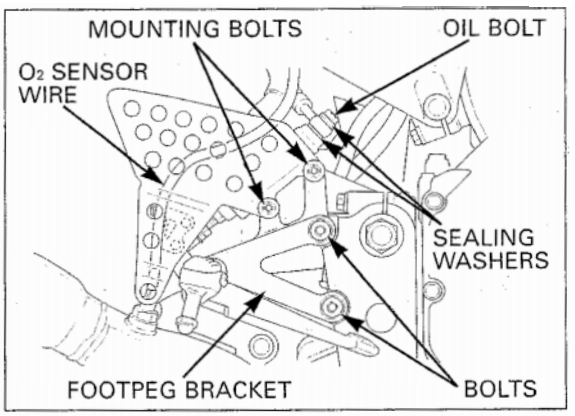
Avoid spilling fluid on painted, plastic, or rubber parts. Place a rag over these parts whenever the system is serviced

Remove the brake hose oil bolt, sealing washers and brake hose.

Loosen the rear master cylinder mounting bolts.
Remove the main footpeg bracket socket bolts and main footpeg bracket assembly.

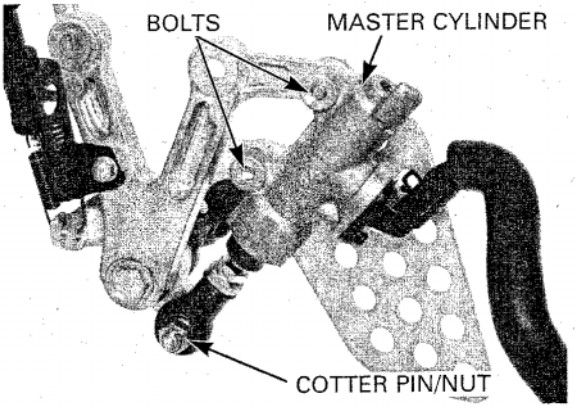
California type only

Release the O_2 sensor wire from the wire guide behind the right step guard.



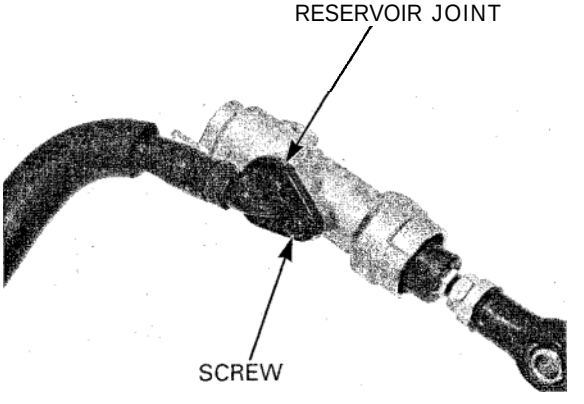
Remove and discard the brake pedal joint cotter pin. Remove the joint pin.

Remove the master cylinder mounting bolts, collars (California type only), step guard and master cylinder.



DISASSEMBLY

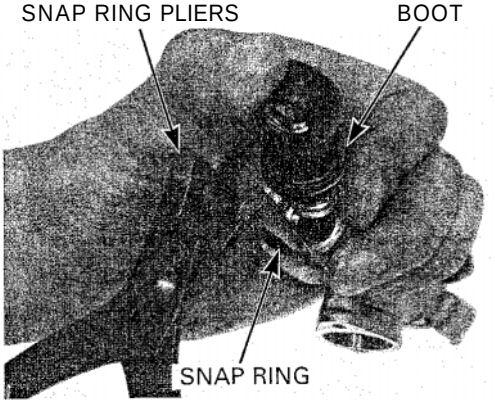
Remove the screw and reservoir hose joint from the master cylinder.



Remove the boot.

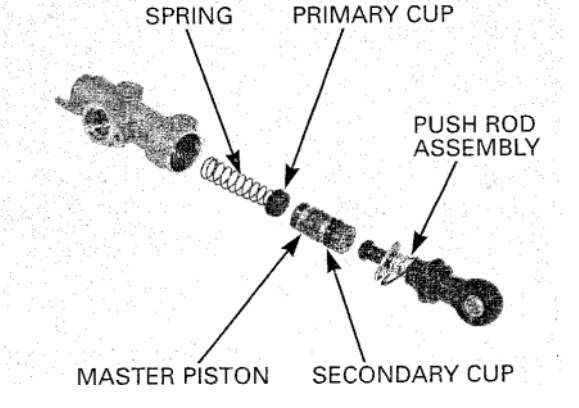
Remove the snap ring from the master cylinder body using the special tool as shown.

TOOL:
Snap ring pliers **07914–SA50000**



Remove the push roc, master piston and spring.

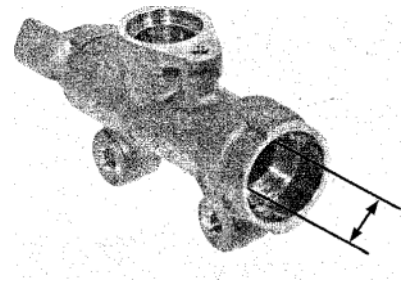
Clean the inside of the cylinder with brake fluid.



INSPECTION

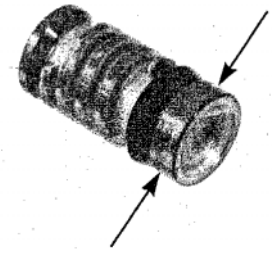
Check the piston boot, primary cup and secondary cup for fatigue or damage.
Check the master cylinder and piston for abnormal scratches.
Measure the master cylinder I.D.

SERVICE LIMIT: 15.925 mm (0.6270 in)

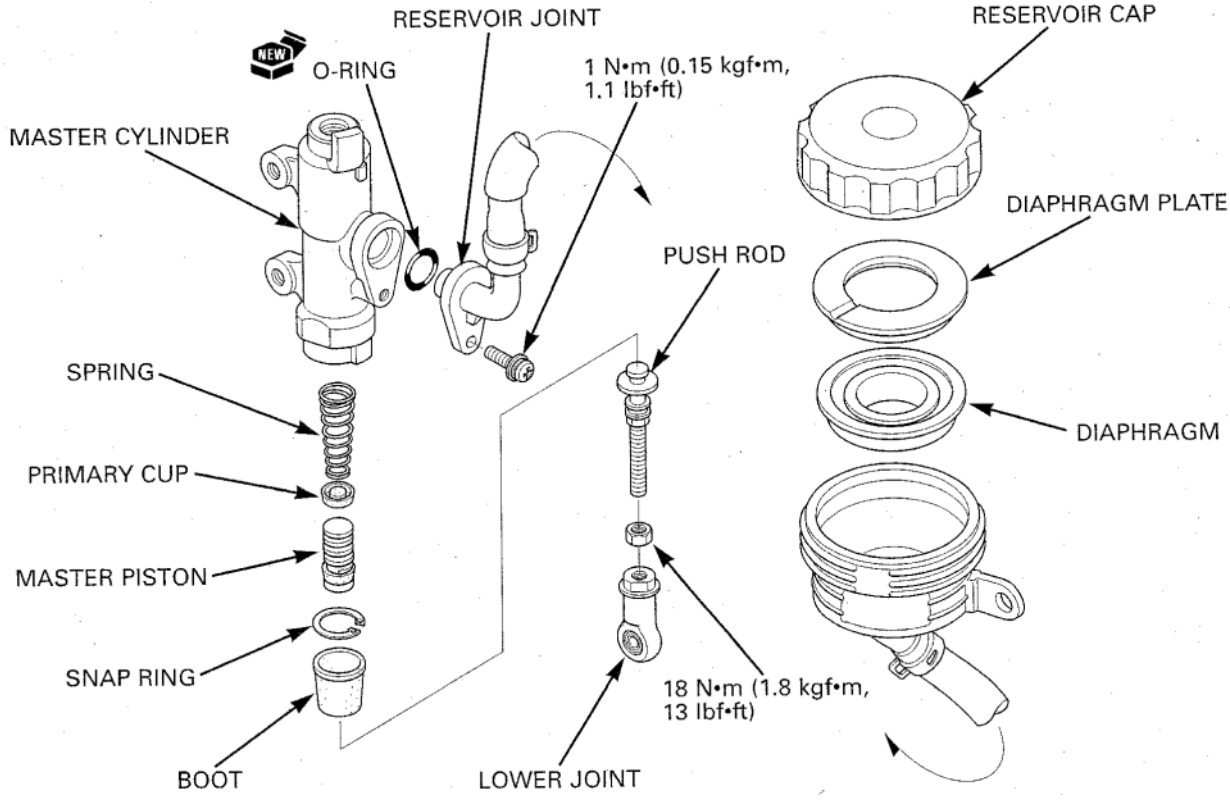


Measure the master cylinder piston O.D.

SERVICE LIMIT: 15.815 mm (0.6226 in)

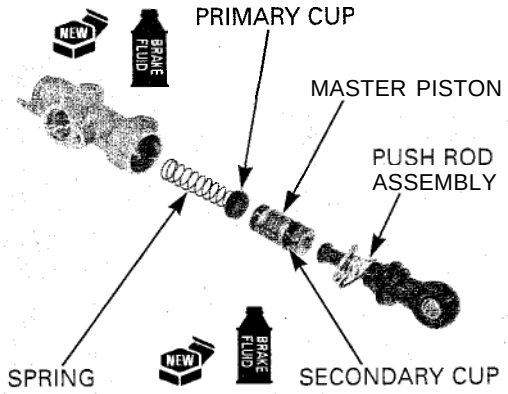


ASSEMBLY



Keep the piston cups spring, snap ring and boo? as a set, do not substitute individual parts

Coat all parts with clean brake fluid before assembly.

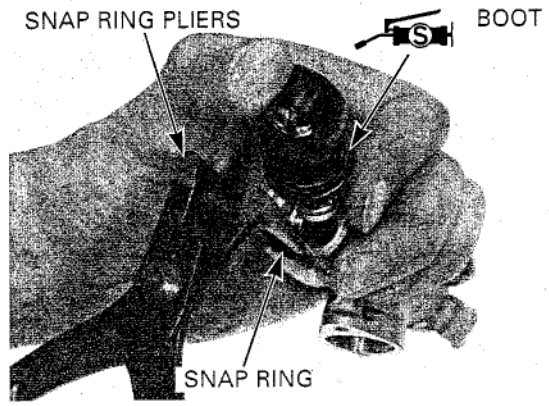


When installing the cuPs, do no? allow the lips to turn inside out

Dip the piston in brake fluid.
Install the spring to the primary cup.
Install the spring/primary cup and master piston assembly.
Apply silicone grease to the piston contact area of the push rod.

if the push rod is disassembled, refer to page 3-26 for push rod length adjustment

Install the push rod into the master cylinder.



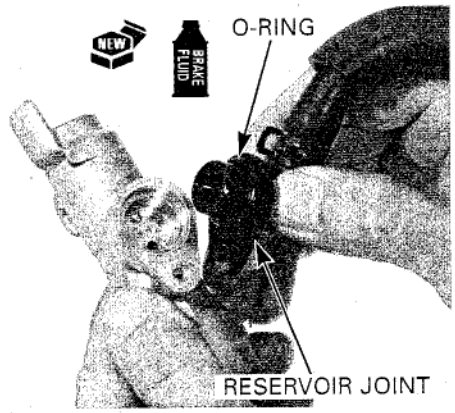
Be certain the snap ring is firmly seated in the groove

Install the snap ring.

TOOL:
Snap ring pliers **07914–SA50000**

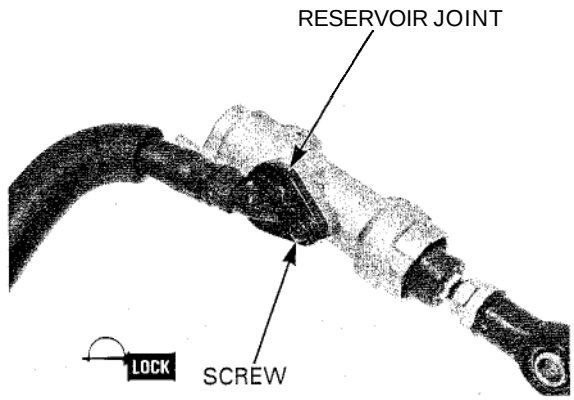
Install the boot.

Apply brake fluid to a new- O-ring and install it onto the reservoir joint.
Install the reservoir joint into the master cylinder.



Apply a locking agent to the reservoir joint screw threads.
Install and tighten the screw to the specified torque.

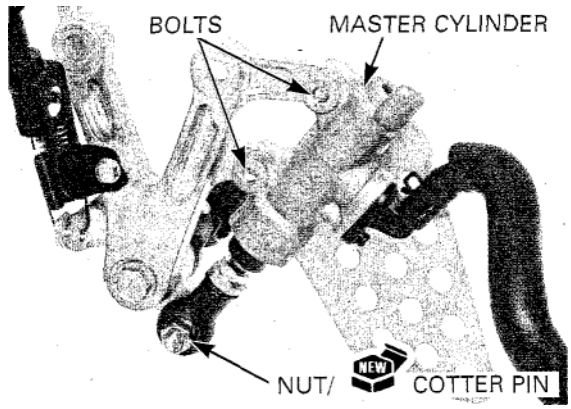
TORQUE: **1 N·m (0.1 kgf·m, 0.7 lbf·ft)**



INSTALLATION

Place the master cylinder onto the main footpeg bracket, install the collars (California type only), step guard and master cylinder mounting bolts.

Connect the brake pedal to the push rod lower joint.
Install the joint pin and secure it with a new cotter pin.



California type only

Clamp the O_2 sensor wire to the wire guide behind the right step guard.

Install the main footpeg bracket onto the lower bracket, tighten the socket bolts to the specified torque.

TORQUE: 39 N·m (4.0 kgf·m, 29 lbf·ft)

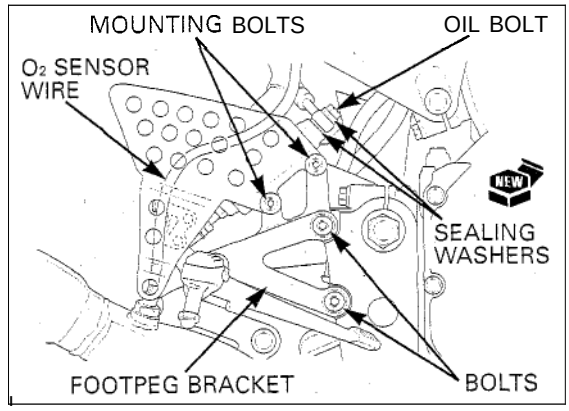
Tighten the master cylinder mounting bolts.

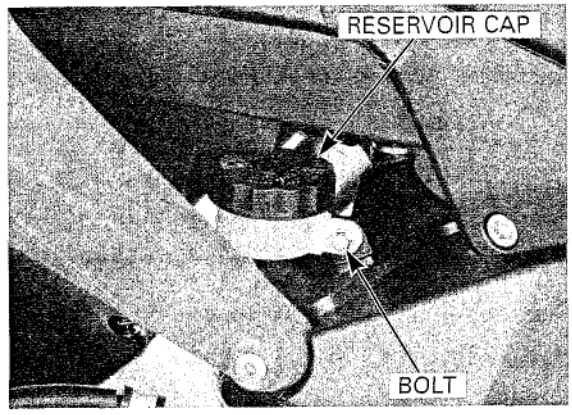
Install the brake hose with the oil bolt and new sealing washers.
Push the eyelet joint against the stopper, then tighten the oil bolt to the specified torque.

TORQUE: 34 N·m (3.5 kgf·m, 25 lbf·ft)

Install and tighten the brake reservoir mounting bolt.

Fill the reservoir to the upper level and bleed the brake system (page 15-5).
Adjust the brake pedal height (page 3-26).





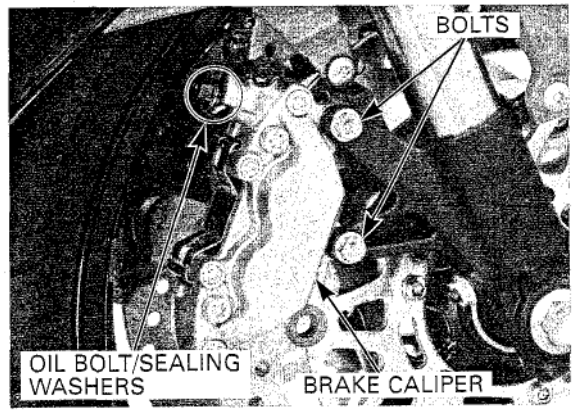
FRONT BRAKE CALIPER

REMOVAL

Drain the front brake hydraulic system (page 15-4).

Avoid spilling fluid on painted, plastic, or rubber parts. Place a rag over these parts whenever the system is serviced

Remove the oil bolt, sealing washers and brake hose eyelet joint.
Remove the caliper mounting bolts, caliper and the brake pads (page 15-8).

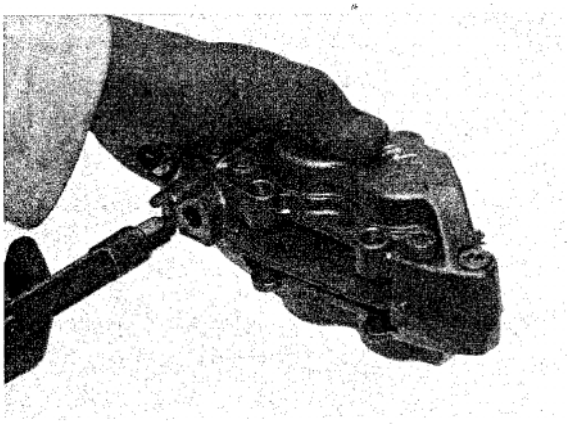


DISASSEMBLY

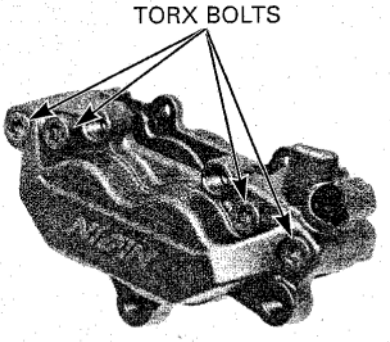
Install corrugated cardboard or equivalent between the pistons.

Do not use high pressure air or bring the nozzle too close to the inlet

Apply small squirts of air pressure to the fluid inlet to remove the pistons.

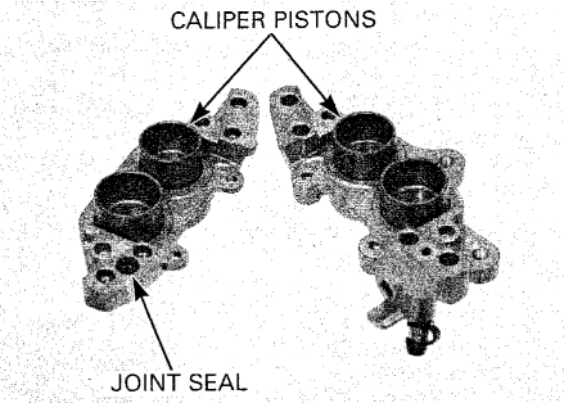


Remove the four caliper assembly torx bolts and separate the caliper halves.



Mark the pistons to ensure correct reassembly

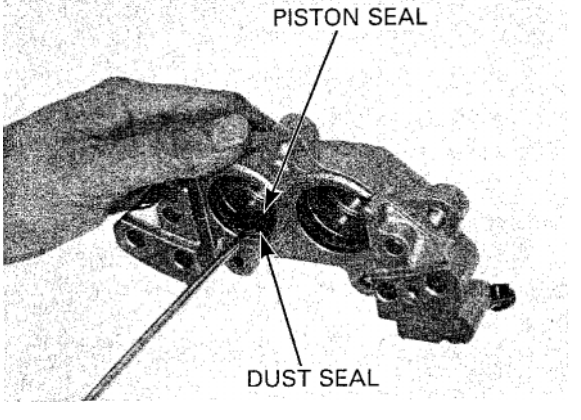
Remove the following:
- Joint seals
- Caliper piston A
- Caliper piston B



Be careful not to damage the piston sliding surface

Push the dust seals and piston seals in and lift them out.

Clean the seal grooves with clean brake fluid.

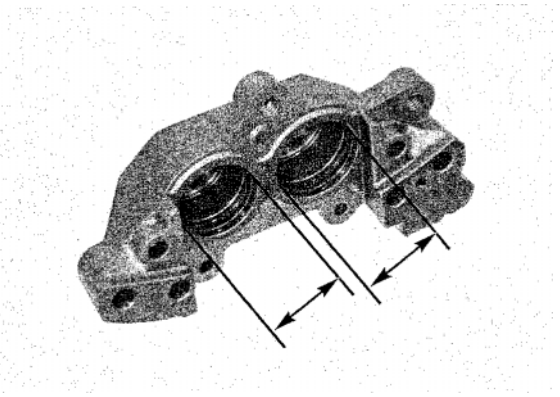


INSPECTION

Check the caliper cylinder for scoring or other damage.

Measure the caliper cylinder I.D.

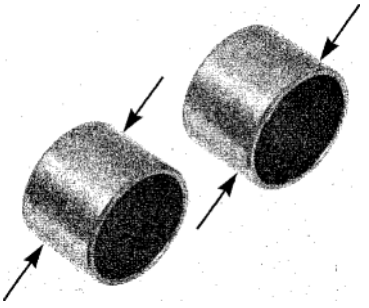
SERVICE LIMITS:
Cylinder A (Upper): 32.05 mm (1.262 in)
Cylinder B (Lower): 30.29 mm (1.193 in)



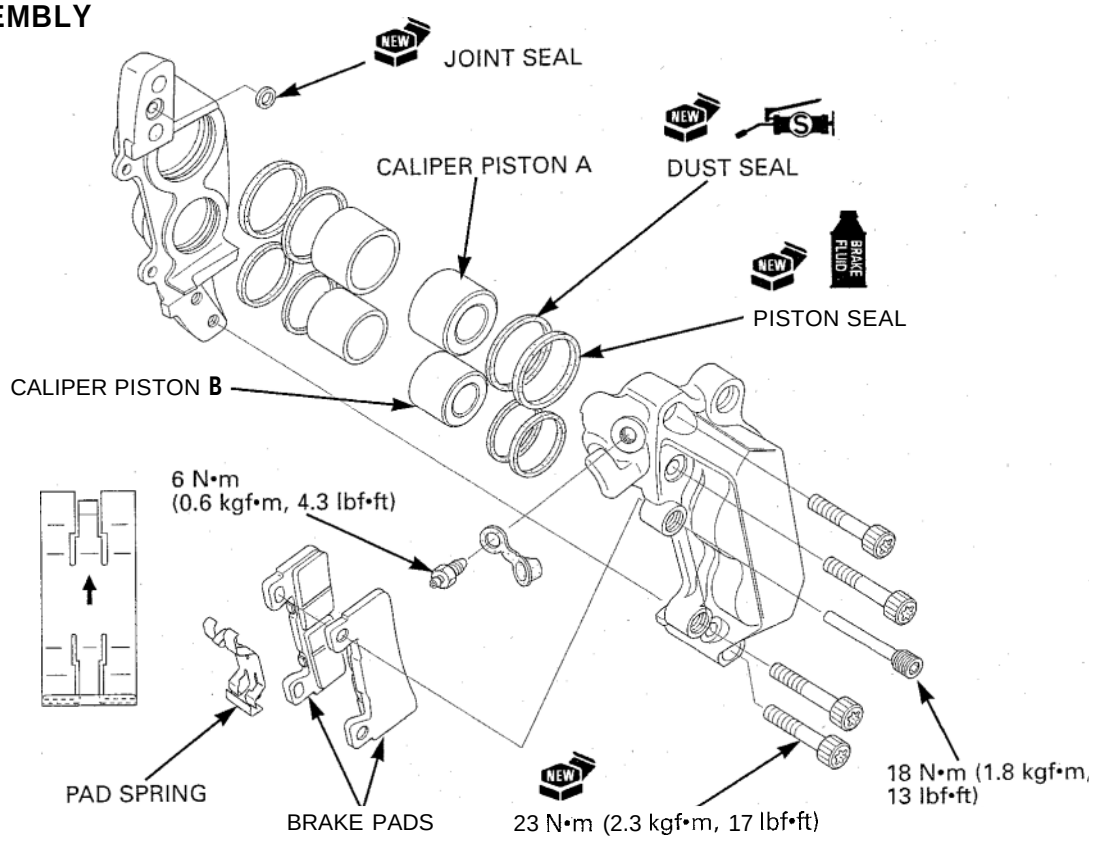
Check the caliper pistons for scratches, scoring or other damage.

Measure the caliper piston O.D.

SERVICE LIMITS:
Piston A (Upper): 31.953 mm (1.2580 in)
Piston B (Lower): 30.074 mm (1.1840 in)



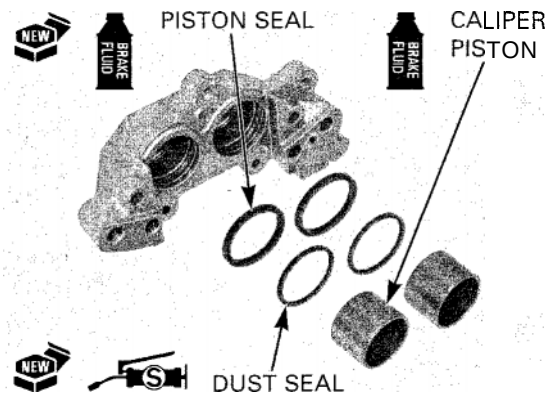
ASSEMBLY



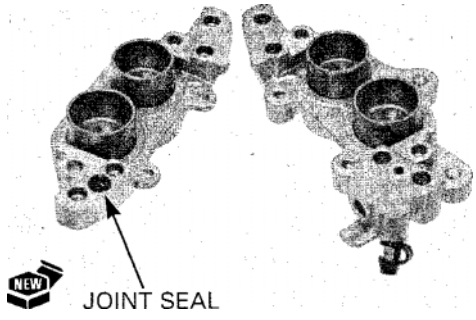
Coat the new piston seals with clean brake fluid.
Coat the new dust seals with silicone grease.

Install the piston and dust seal into the groove of the caliper body.

Coat the caliper pistons with clean brake fluid and install them into the caliper cylinder with their open ends toward the pad.

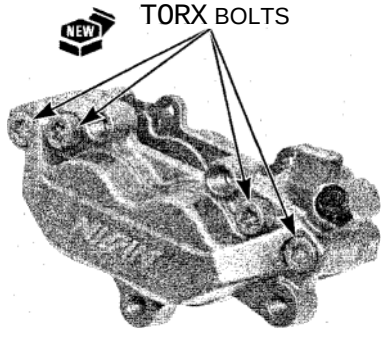


Install the new joint seal into the fluid passage on the caliper.



Assemble the caliper halves and install and tighten the new caliper assembly torx bolts to the specified torque.

TORQUE: 23 N·m (2.3kgf·m, 17 lbf·ft)



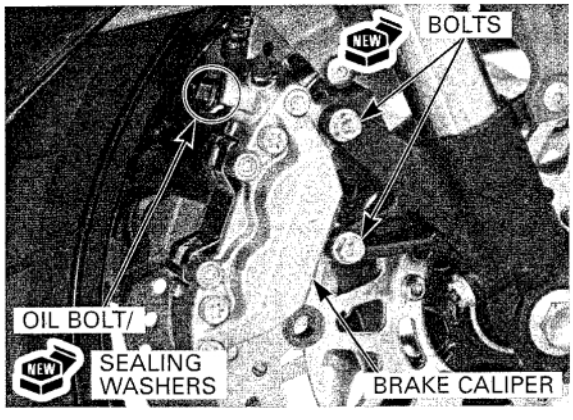
INSTALLATION

Install the brake pads and caliper onto the fork leg (page 15-9).

Install and tighten the new caliper mounting bolts to the specified torque.

TORQUE: 30 N·m (3.1kgf·m, 22 lbf·ft)

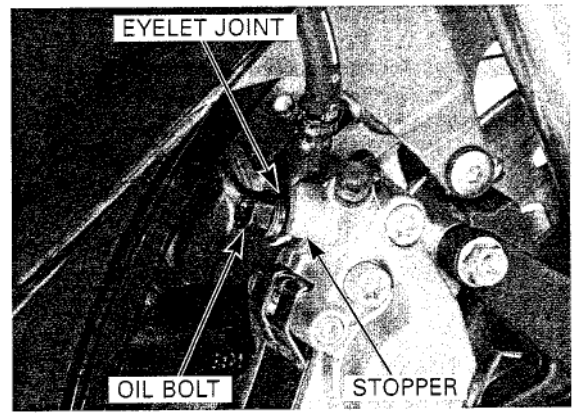
Install the brake hose eyelet to the caliper body with two new sealing washers and oil bolt.



Push the brake hose eyelet to the stopper on the caliper, then tighten the oil bolt to the specified torque.

TORQUE: 34 N·m (3.5 kgf·m, 25 lbf·ft)

Fill and bleed the front brake hydraulic system (page 15-5).



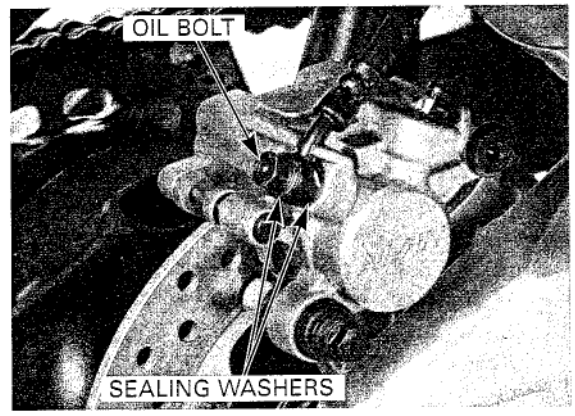
REAR BRAKE CALIPER

REMOVAL

Drain the rear brake hydraulic system (page 15-4).

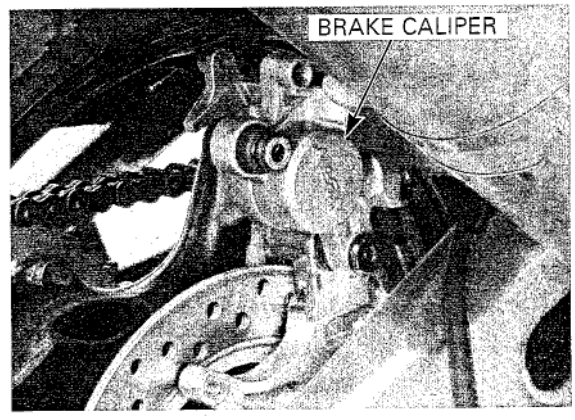
Avoid spilling fluid on painted, plastic, or rubber parts Place a rag over these parts whenever the system is serviced

Remove the oil bolt, sealing washers and brake hose eyelet joint.



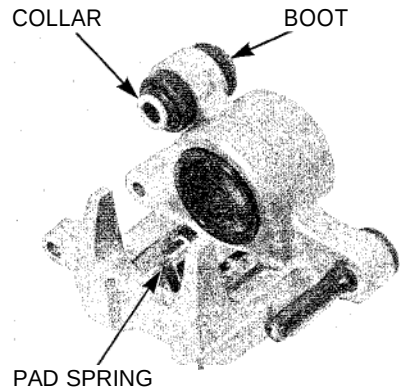
Remove the caliper bracket bolts and the brake pads (page 15-10).

Pivot the caliper up and remove it.



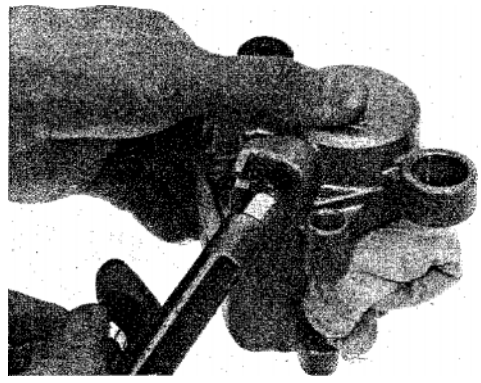
DISASSEMBLY

Remove the pad spring, collar and boot from the caliper body.



Do not use high pressure air or bring the nozzle too close to the inlet

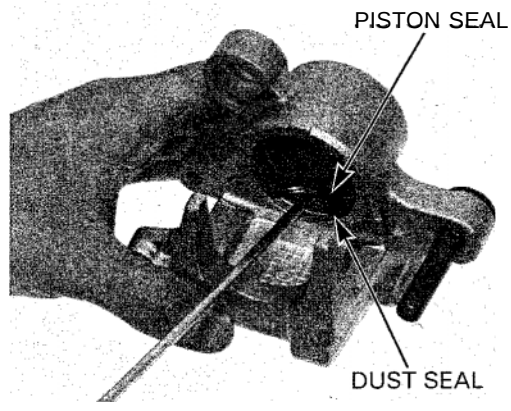
Place a shop towel over the piston.
Position the caliper body with the piston down and apply small squirts of air pressure to the fluid inlet to remove the piston.



Be careful not to damage the piston sliding surface

Push the dust seal and piston seal in and lift them out.

Clean the seal grooves with clean brake fluid.



INSPECTION

Check the caliper cylinder for scoring or other damage.

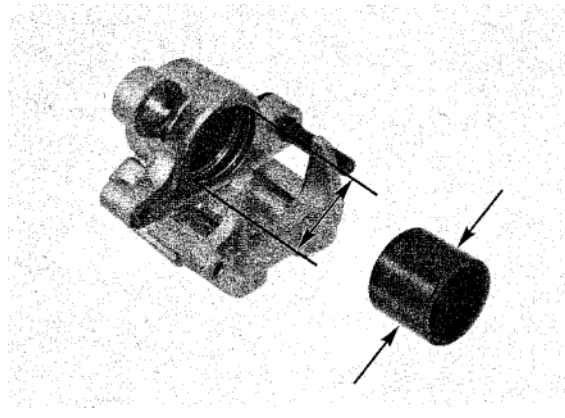
Measure the caliper cylinder I.D.

SERVICE LIMIT: 38.24 mm (1.506 in)

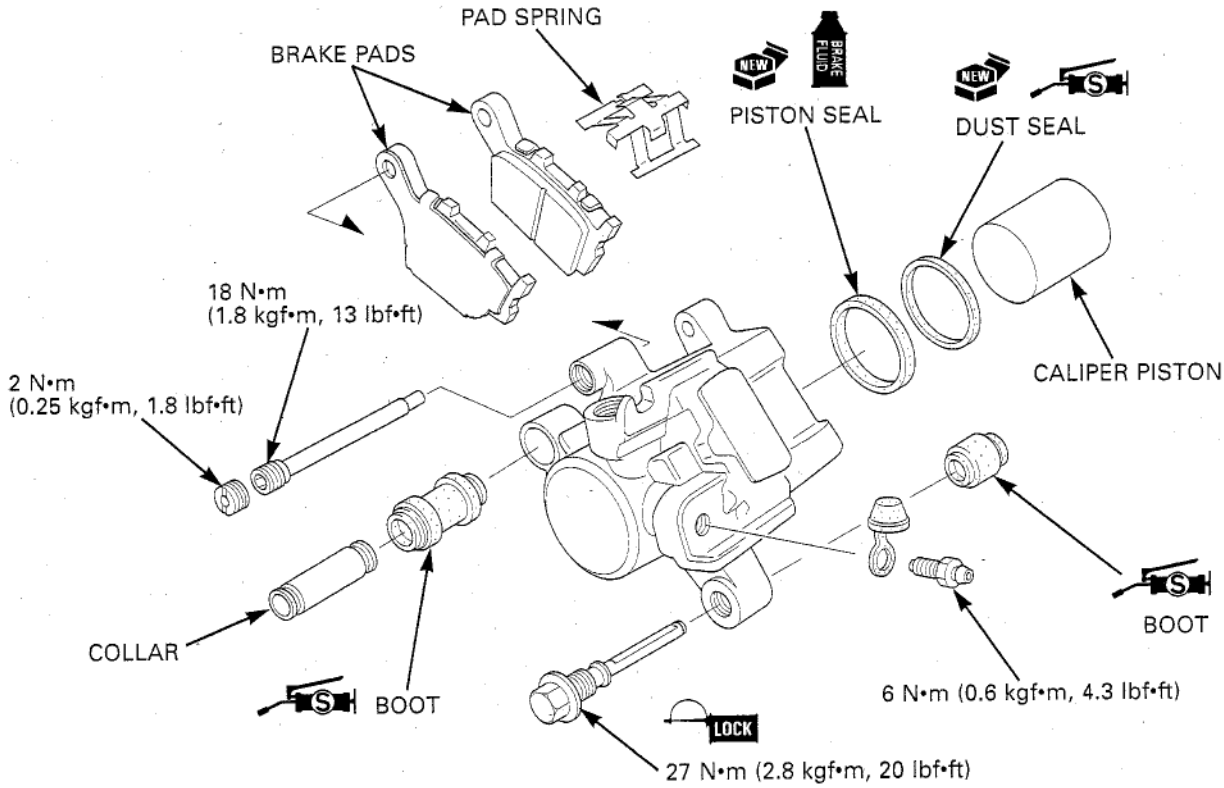
Check the caliper pistons for scratches, scoring or other damage.

Measure the caliper piston O.D.

SERVICE LIMIT: 38.090 mm (1.4996 in)



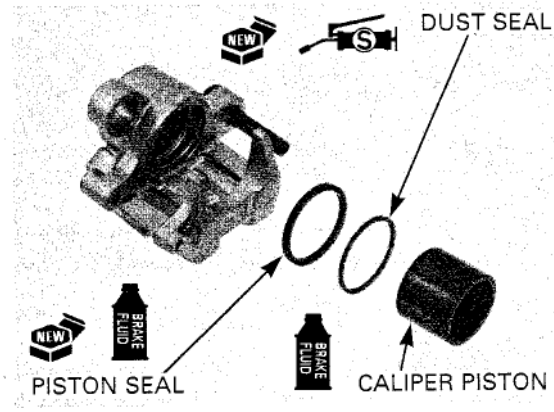
ASSEMBLY



Coat the new piston seal with clean brake fluid.
Coat the new dust seal with silicone grease.

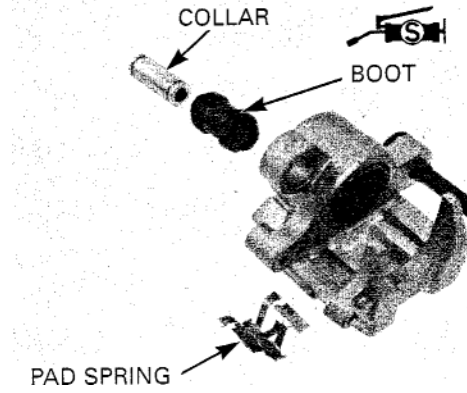
Install the piston seal and dust seal into the groove of the caliper body.

Coat the caliper piston with clean brake fluid and install it into the caliper cylinder with its opening end toward the pad.



Install the pad spring into the caliper body.
If the caliper and bracket pin boots are hard or deteriorated, replace them with new ones.

Apply silicone grease to the inside of the bracket pin boot.
install the bracket pin boot and collar into the caliper.



Install the pad retainer into the bracket.

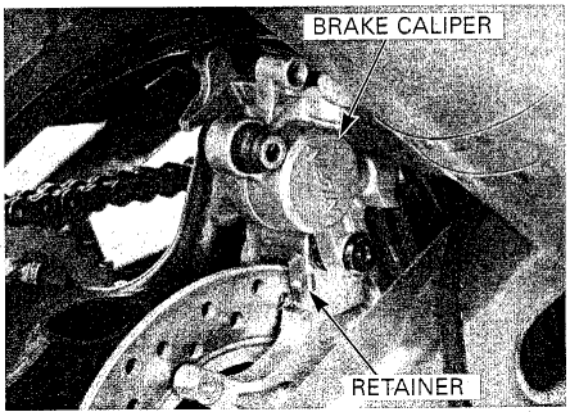
INSTALLATION

Apply silicone grease to the caliper pin and install the caliper onto the bracket.

Install the rear brake pads (page 15-11).

Install and tighten the caliper mounting bolt to the specified torque.

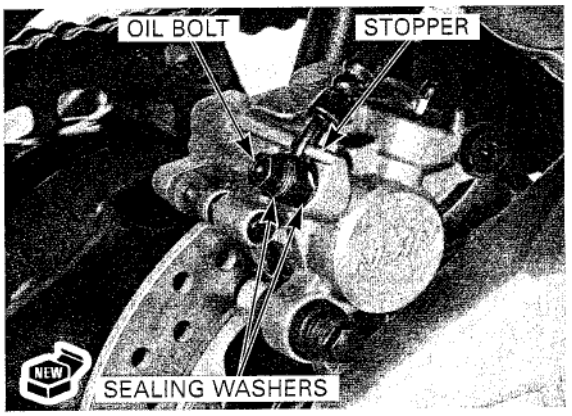
TORQUE: 22 N·m (2.2 kgf·m, 16 lbf·ft)



Install the brake hose eyelet to the caliper body with two new sealing washers and oil bolt.
Align the brake hose eyelet to the stopper on the caliper, then tighten the oil bolt to the specified torque.

TORQUE: 34 N·m (3.5 kgf·m, 25 lbf·ft)

Fill and bleed the rear brake hydraulic system (page 15-5).



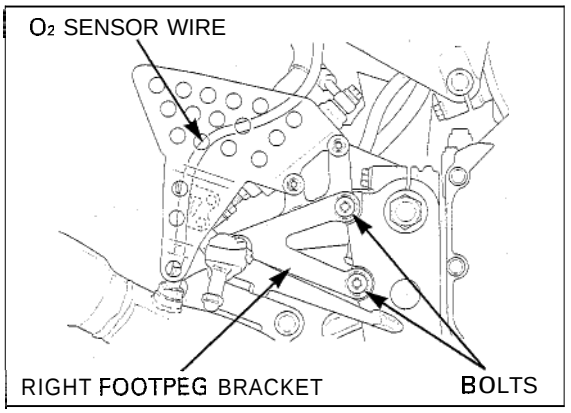
BRAKE PEDAL

REMOVAL

California type only

Release the O_2 sensor wire from the wire guide behind the right step guard.

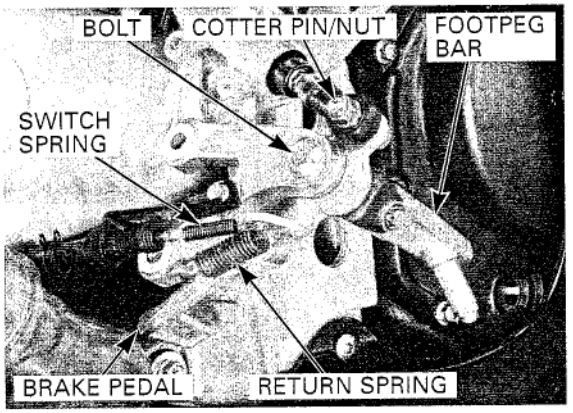
Remove the main footpeg bracket mounting bolts and bracket assembly from the lower bracket.



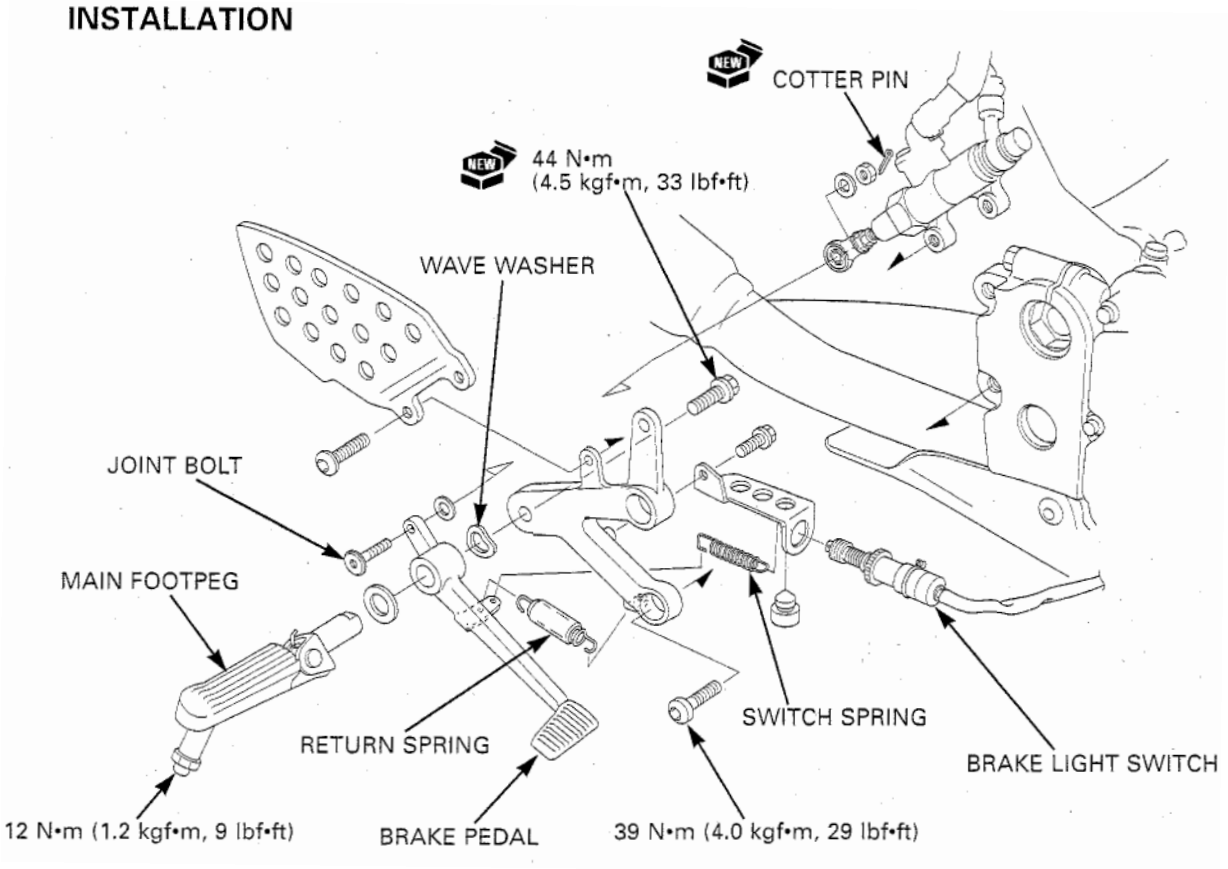
Remove and discard the brake pedal joint cotter pin.
Remove the joint pin.

Unhook the return spring and remove the brake light switch from the step holder.
Unhook the brake pedal return spring.

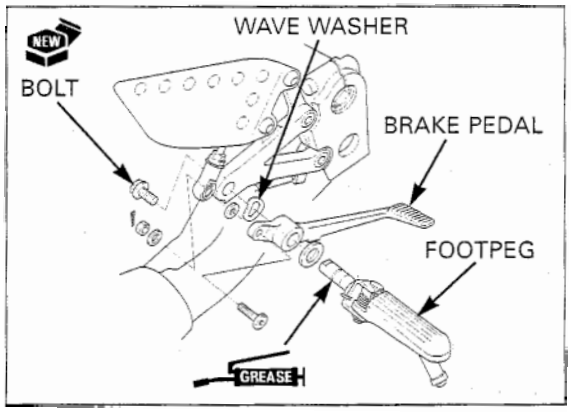
Remove the footpeg mounting bolt, footpeg, brake pedal and wave washer.



INSTALLATION



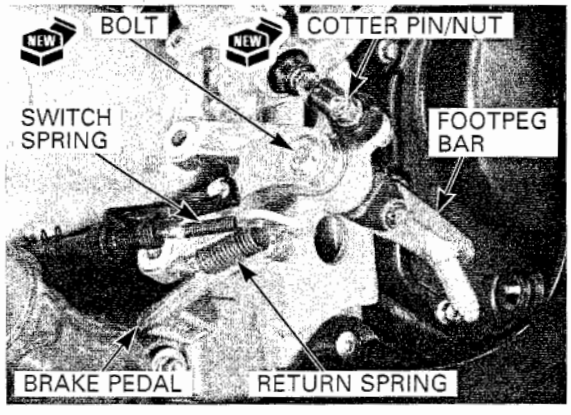
Apply grease to the sliding surface of the brake pedal and footpeg.
Assemble the brake pedal, footpeg and wave washer.



Install a new footpeg mounting bolt and tighten it to the specified torque.

TORQUE: 44 N•m (4.5 kgf•m, 33 lbf•ft)

Attach the brake pedal return spring.
Install the brake light switch and attach the switch spring.
Connect the brake pedal to the push rod lower joint.
Install the joint pin and secure it with a new cotter pin.

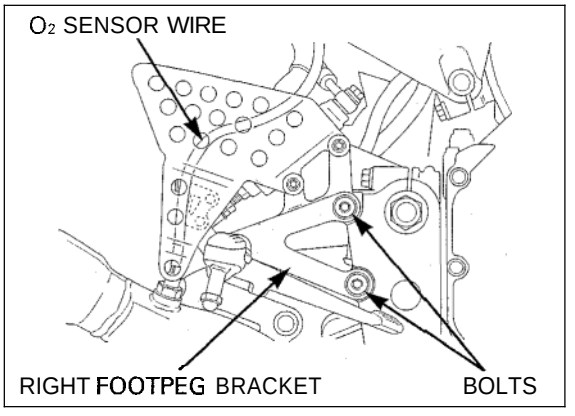


California type only

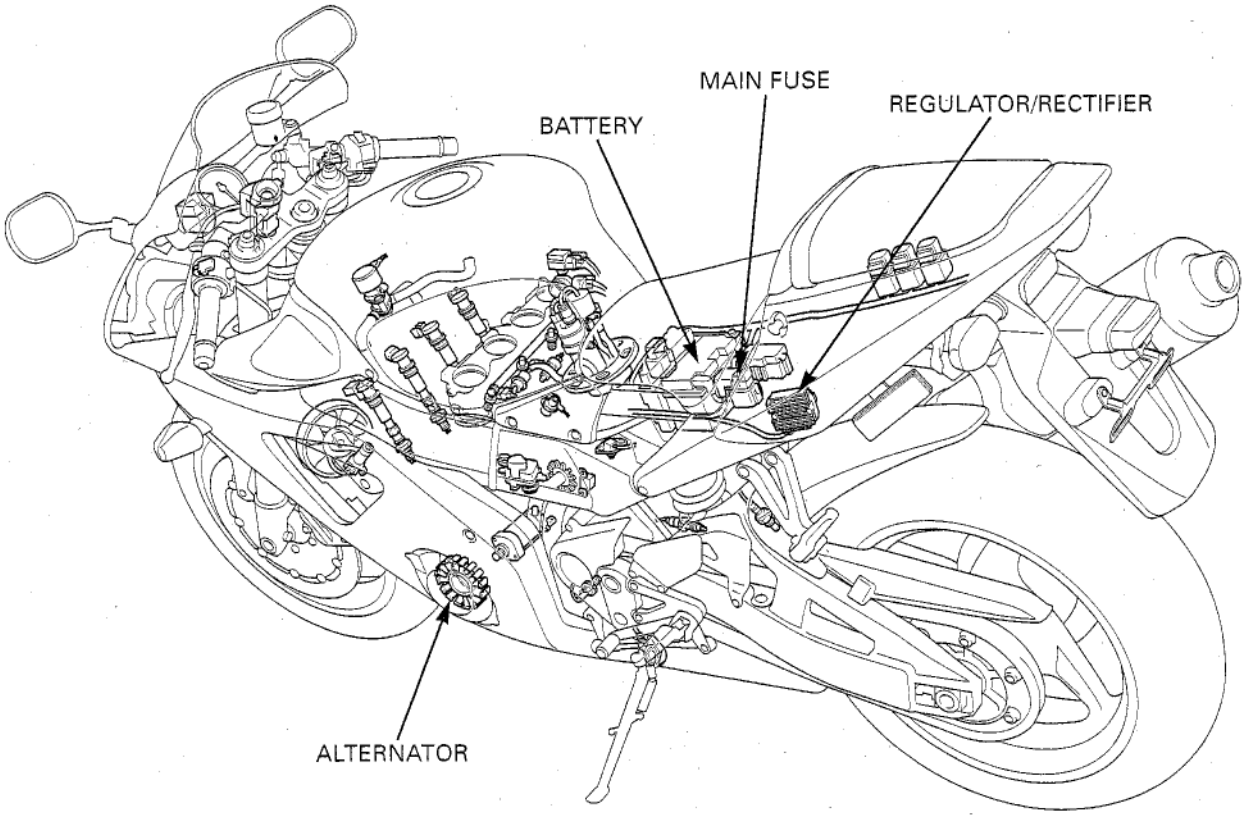
Clamp the O_2 sensor wire to the wire guide behind the right step guard.

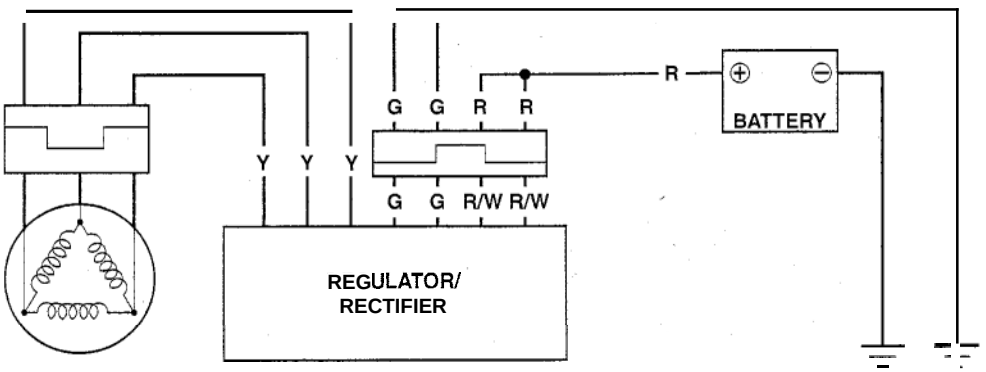
Install the right main footpeg bracket assembly onto the lower bracket.
Install and tighten the right main footpeg bracket socket bolts to the specified torque.

TORQUE: 39 N•m (4.0kgf•m, 29 lbf•ft)



SYSTEM DIAGRAM





Y.....YELLOW
Bl.....BLACK
Bu....BLUE
G.....GREEN
R.....RED

16. BATTERY/CHARGING SYSTEM

SYSTEM DIAGRAM	16-0	CHARGING SYSTEM INSPECTION	16-6
SERVICE INFORMATION	16-1	ALTERNATOR CHARGING COIL	16-7
TROUBLESHOOTING	16-3	REGULATOR/RECTIFIER	16-7
BATTERY	16-4		

SERVICE INFORMATION

GENERAL

⚠ WARNING

- The battery gives off explosive gases; keep sparks, flames and cigarettes away. Provide adequate ventilation when charging.
- The battery contains sulfuric acid (electrolyte). Contact with skin or eyes may cause severe burns. Wear protective clothing and a face shield.
  - If electrolyte gets on your skin, flush with water.
  - If electrolyte gets in your eyes, flush with water for at least 15 minutes and call a physician immediately.
- Electrolyte is poisonous.
  - If swallowed, drink large quantities of water or milk and call your local Poison Control Center or a call a physician immediately.

- Always turn off the ignition switch before disconnecting any electrical component.
- Some electrical components may be damaged if terminals or connectors are connected or disconnected while the ignition switch turned to "ON" and current is present.
- For extended storage, remove the battery, give it a full charge, and store it in a cool, dry space. For maximum service life, charge the stored battery every two weeks.
- For a battery remaining in a stored motorcycle, disconnect the negative battery cable from the battery terminal.
- The maintenance free battery must be replaced when it reaches the end of its service life.
- The battery can be damaged or overcharged or undercharged, or left to discharge for long periods. These same conditions contribute to shortening the "life span" of the battery. Even under normal use, the performance of the battery deteriorates after 2–3 years.
- Battery voltage may recover after battery charging, but under heavy load, battery voltage will drop quickly and eventually die out. For this reason, the charging system is often suspected as the problem. Battery overcharge often results from problems in the battery itself, which may appear to be an overcharging symptom. If one of the battery cells is shorted and battery voltage does not increase, the regulator/rectifier supplies excess voltage to the battery. Under these conditions, the electrolyte level goes down quickly.
- Before troubleshooting the charging system, check for proper use and maintenance of the battery. Check if the battery is frequently under heavy load, such as having the headlight and tail light on for long periods of time without riding the motorcycle.

- The battery will self-discharge when the motorcycle is not in use. For this reason, charge the battery every 2 weeks to prevent sulfation from occurring.
- When checking the charging system, always follow the steps in the troubleshooting flow chart (page 16-3).
- For battery charging, do not exceed the charging current and time specified on the battery. Use of excessive current or charging time may damage the battery.

BATTERY TESTING

Refer to the instruction of the Operation Manual for the recommended battery tester. The recommended battery tester puts a "load" on the battery so that the actual battery condition of the load can be measured.

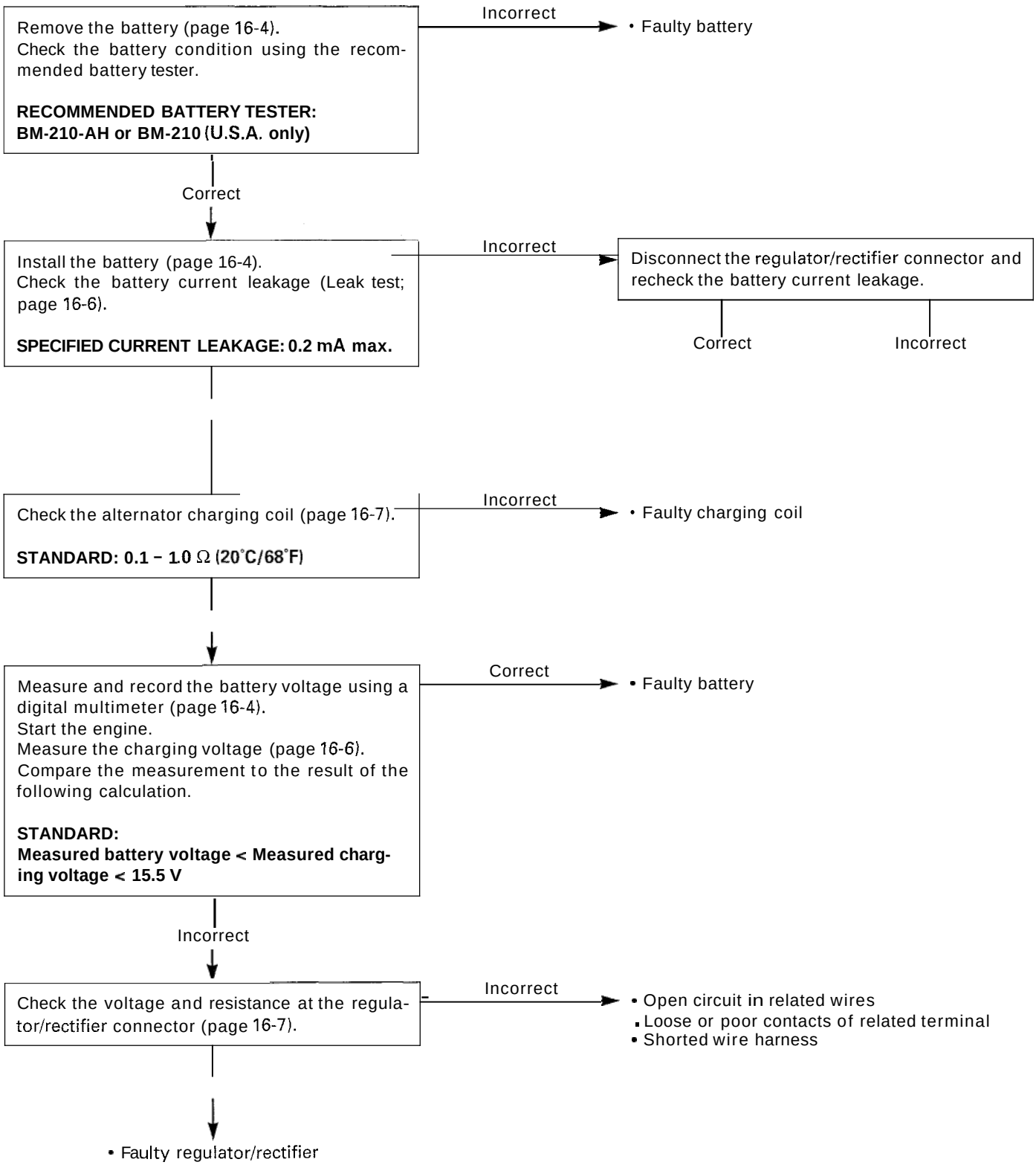
Recommended battery tester BM–210–AH or BM–210 (U.S.A. only)

SPECIFICATIONS

ITEM			SPECIFICATIONS
Battery	Capacity		12V – 8.6 Ah
	Current leakage		0.2 mA max.
	Voltage (20°C/68°F)	Fully charged	13.0 – 13.2 V
		Needs charging	Below 12.3 V
	Charging current	Normal	0.9 A/5 – 10 h
		Quick	4.0 A/0.5 h
Alternator	Capacity		0.421 kW/5,000 rpm
	Charging coil resistance (20°C/68°F)		0.1 – 1.0 Ω

TROUBLESHOOTING

BATTERY IS DAMAGED OR WEAK



BATTERY

REMOVAL/INSTALLATION

Always turn the ignition switch to "OFF" before removing the battery

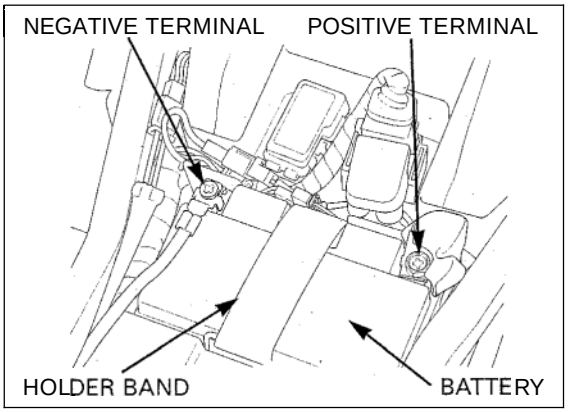
Remove the seat (page 2-2).

Remove the battery holder band.
Disconnect the negative cable and then the positive cable, and remove the battery.

Connect the positive terminal first and then the negative cable

Install the battery in the reverse order of removal with the proper wiring as shown.

After installing the battery, coat the terminals with clean dielectric grease.

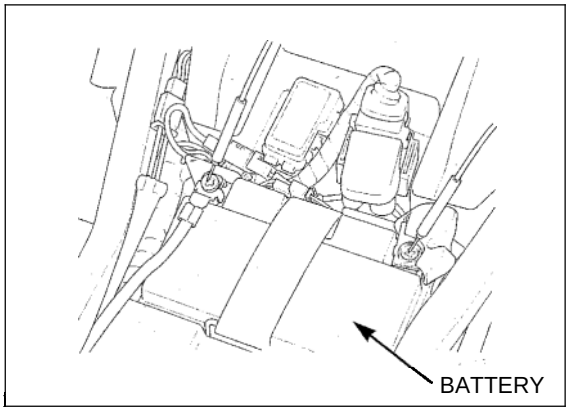


VOLTAGE INSPECTION

Measure the battery voltage using a digital multimeter.

VOLTAGE:
Fully charged: 13.0 – 13.2V
Under charged: Below 12.3V

TOOL:
Digital multimeter **Commercially available**



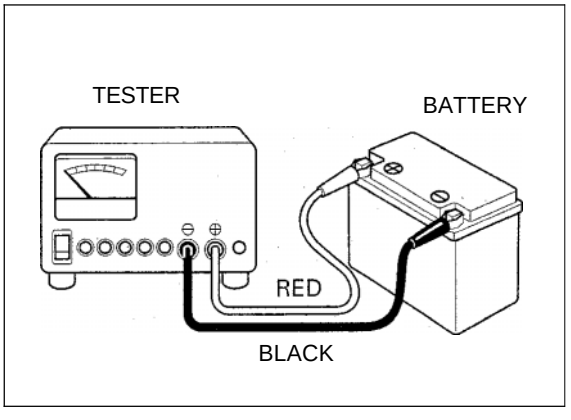
BATTERY TESTING

- Always clear the work area of flammable materials such as gasoline, brake fluid, electrolyte, or cloth towels when operating the tester, the heat generated by the tester may cause a fire.

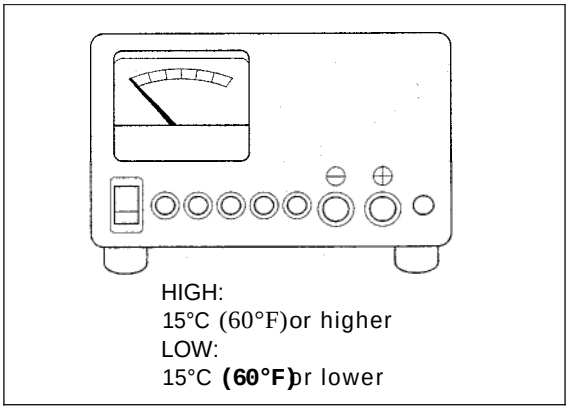
Remove the battery (see above)

Securely connect the tester's positive (+) cable first, then connect the negative (–) cable.

TOOL:
Battery tester **BM–210–AH or BM–210 (U.S.A. only)**



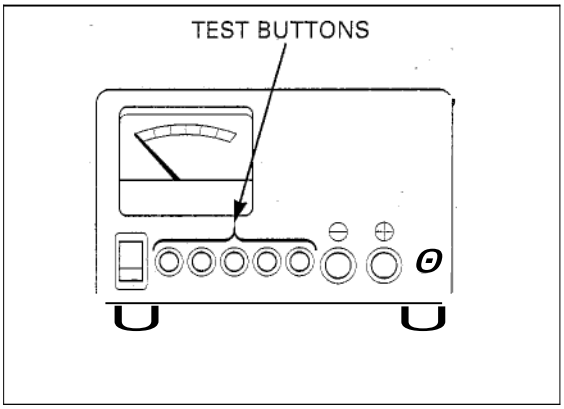
Set the temperature switch to "HIGH" or "LOW" depending on the ambient temperature.

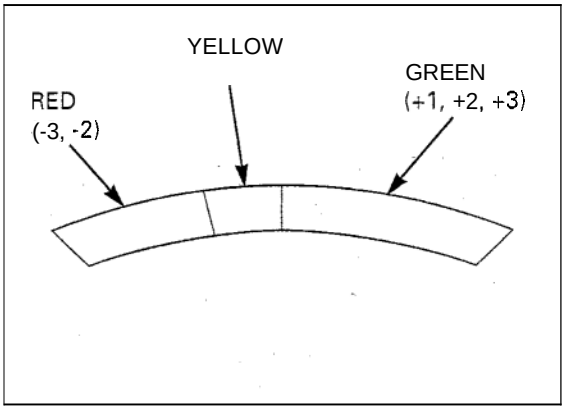


Push in the appropriate test button for 3 seconds and read the condition of the battery on the meter.

Tester damage can result from overheating when:
- The test button is pushed in for more than 3 seconds.
- The tester is used without being allowed to cool for at least 1 minute when testing more than one battery.
- More than ten consecutive tests are performed without allowing at least a 30–minute cool–down period.

The result of a test on the meter scale is relative to the amp. hour rating of the battery. Any battery reading in the green zone is ok. Batteries should only be charged if they register in the YELLOW or RED zone.





BATTERY CHARGING

Remove the battery (page 16–4).

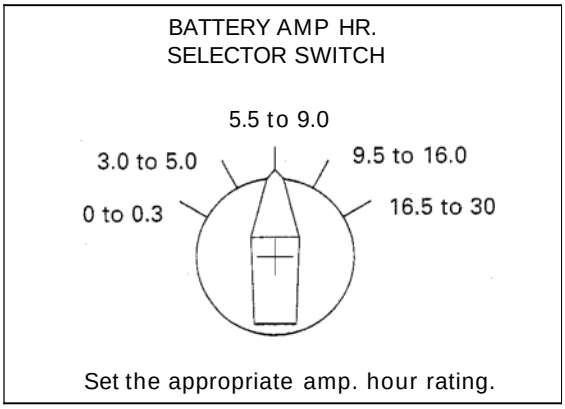
- Clean the battery terminals and position the battery as far away from the charger as the leads will permit.
- Do not place the battery below the charger – gases from the battery may corrode and damage the charger.
- Do not place the battery on top of the charger. Be sure the air vents are not blocked.

TOOL:
Christie battery charger **MC1012/2 (U.S.A. only)**

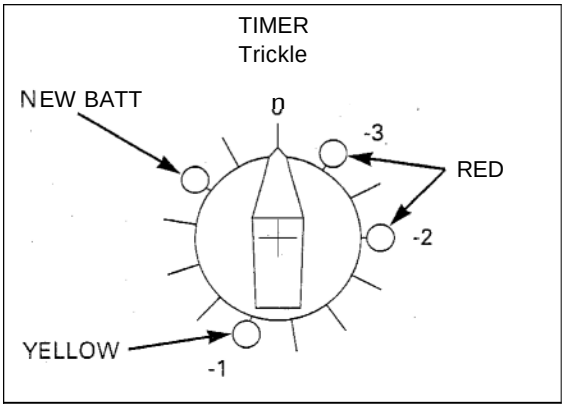
1. Turn the "POWER" switch to "OFF".
2. Set the "BATTERY AMP HR. SELECTOR SWITCH" for the size of the battery being charged.
3. Set the "TIMER" to the position indicated by the Honda Battery Tester; RED–3, RED–2 or YELLOW 1. If you are charging a new battery, set the switch to the "NEW BATT" position.
4. Attach the clamps to the battery terminals: red to positive, black to negative.

Connect the battery cables only when the Power Switch is OFF.

5. Turn the "POWER" switch to "ON".
6. When the timer reaches the "Trickle" position, the charging cycle is complete. Turn the "POWER" switch to "OFF" and disconnect the clamps.
7. Let the battery cool for at least 10 minutes or until gassing subsides after charging.
8. Retest the battery using the Honda battery tester and recharge if necessary using the above steps.

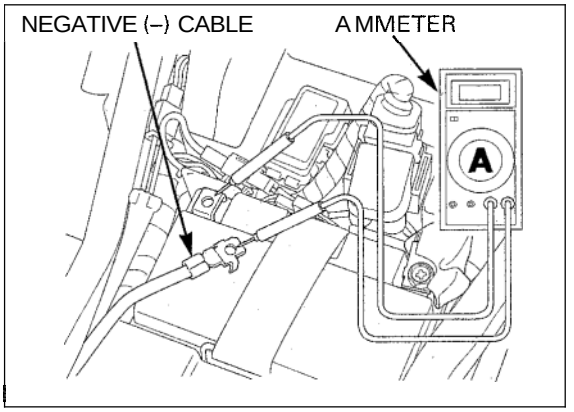


Set the appropriate amp. hour rating.



CHARGING SYSTEM INSPECTION

CURRENT LEAKAGE INSPECTION



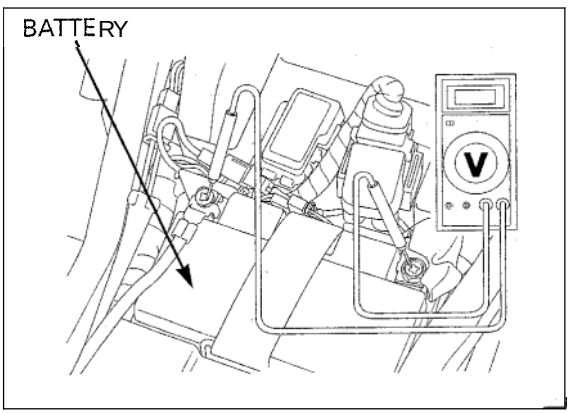
Turn the ignition switch off and disconnect the negative battery cable from the battery.
Connect the ammeter (+) probe to the ground cable and the ammeter (–) probe to the battery (–) terminal.
With the ignition switch off, check for current leakage.

- When measuring current using a tester, set it to a high range, and then bring the range down to an appropriate level. Current flow higher than the range selected may blow out the fuse in the tester.
- While measuring current, do not turn the ignition on. A sudden surge of current may blow out the fuse in the tester.

SPECIFIED CURRENT LEAKAGE: 0.2 mA max.

If current leakage exceeds the specified value, a shorted circuit is likely.
Locate the short by disconnecting connections one by one and measuring the current.

CHARGING VOLTAGE INSPECTION



- To prevent a short, make absolutely certain which are the positive and negative terminals or cable.

Restart the engine.
With the headlight on Hi beam, measure the voltage on the multimeter when the engine runs at 5,000 rpm.

Standard: Measured battery voltage (page 16-4) < Measured charging voltage (see above) < 15.5 V at 5,000 rpm

ALTERNATOR CHARGING COIL

INSPECTION

Do not disconnect the battery or any cable in the charging system without first switching off the ignition switch Failure to follow this precaution can damage the tester or electrical components

Remove the ECM cover (page 5-87).

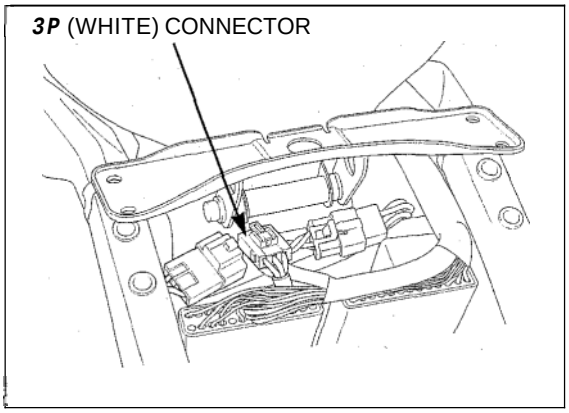
Disconnect the alternator 3P (White) connector.

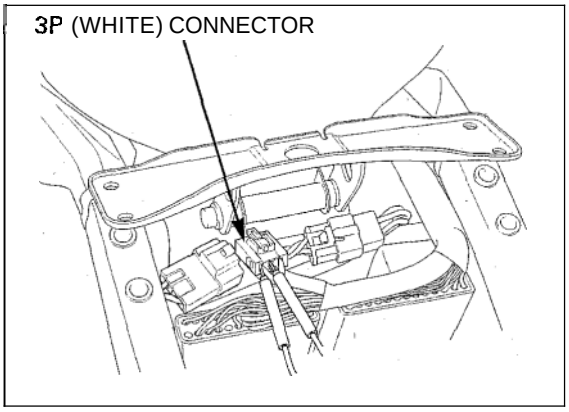
Check the resistance between all three Yellow terminals.

STANDARD: 0.1 – 1.0 Ω (at 20°C/68°F)

Check for continuity between all three Yellow terminals and Ground.
There should be no continuity.

If readings are far beyond the standard, or if any wire has continuity to ground, replace the alternator stator. Refer to section 10 for stator removal.





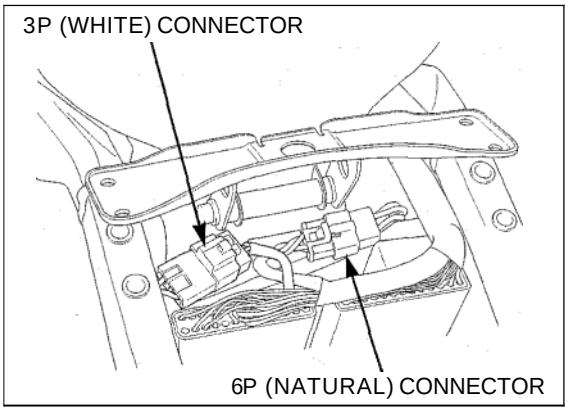
REGULATOR/RECTIFIER

It is not necessary to remove the stator coil to perform this test.

SYSTEM INSPECTION

Remove the ECM cover (page 5-87).

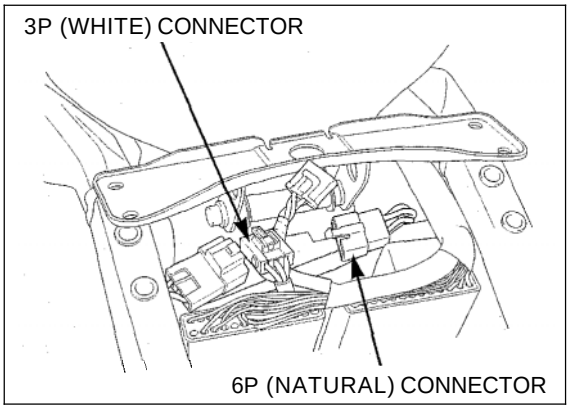
Disconnect the regulator/rectifier 6P (Natural) connector and alternator 3P (White) connector.
Check it for loose contact or corroded terminals.



If the regulated voltage reading (see page 16-6) is out of the specification, measure the voltage between connector terminals (wire harness side) as follows:

Item	Terminal	Specification
Battery charging line	Red/White (+) and ground (–)	Battery voltage should register
Charging coil line	Yellow and Yellow	0.1 – 1.0 Ω (at 20°C/68°F)
Ground line	Green and ground	Continuity should exist

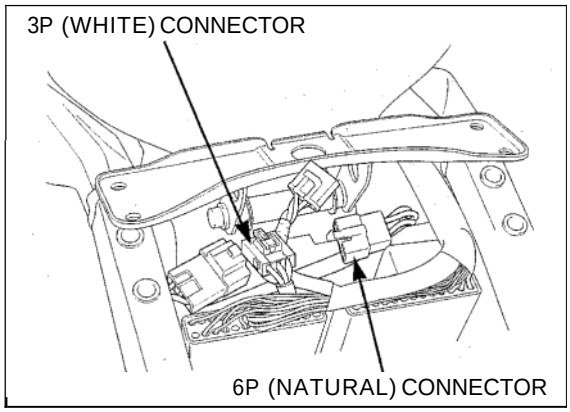
If all components of the charging system are normal and there are no loose connections at the regulator/rectifier connectors, replace the regulator/rectifier unit.



REMOVAL/INSTALLATION

Remove the rear cowl (page 2-2).
Remove the ECM cover (page 5-87).

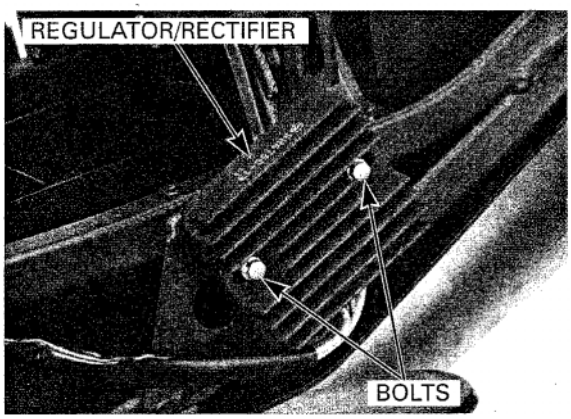
Disconnect the alternator 3P (White) connector.
Disconnect the regulator/rectifier 6P (Natural) connector.



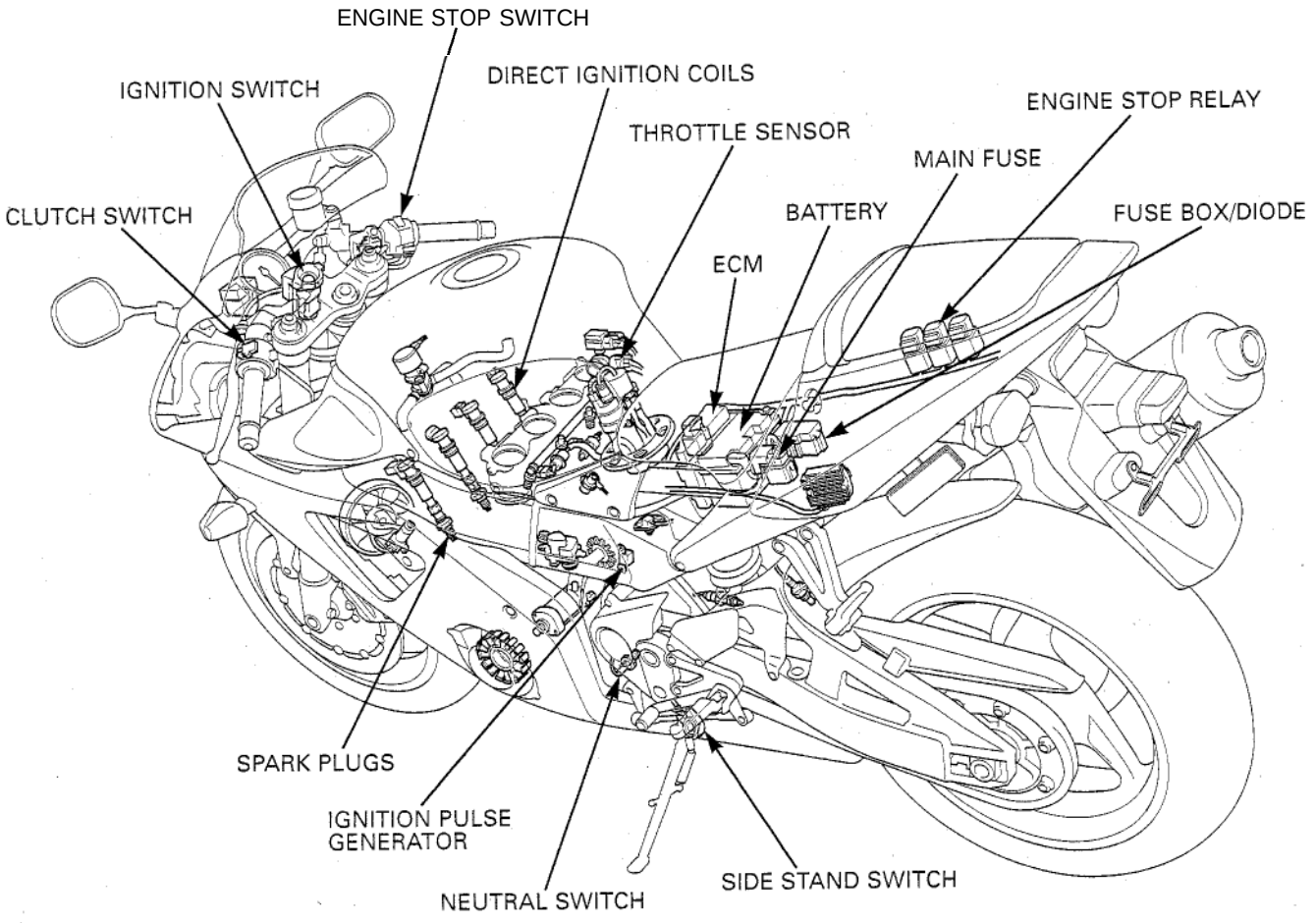
Remove the regulator/rectifier unit mounting SH bolts and regulator/rectifier.

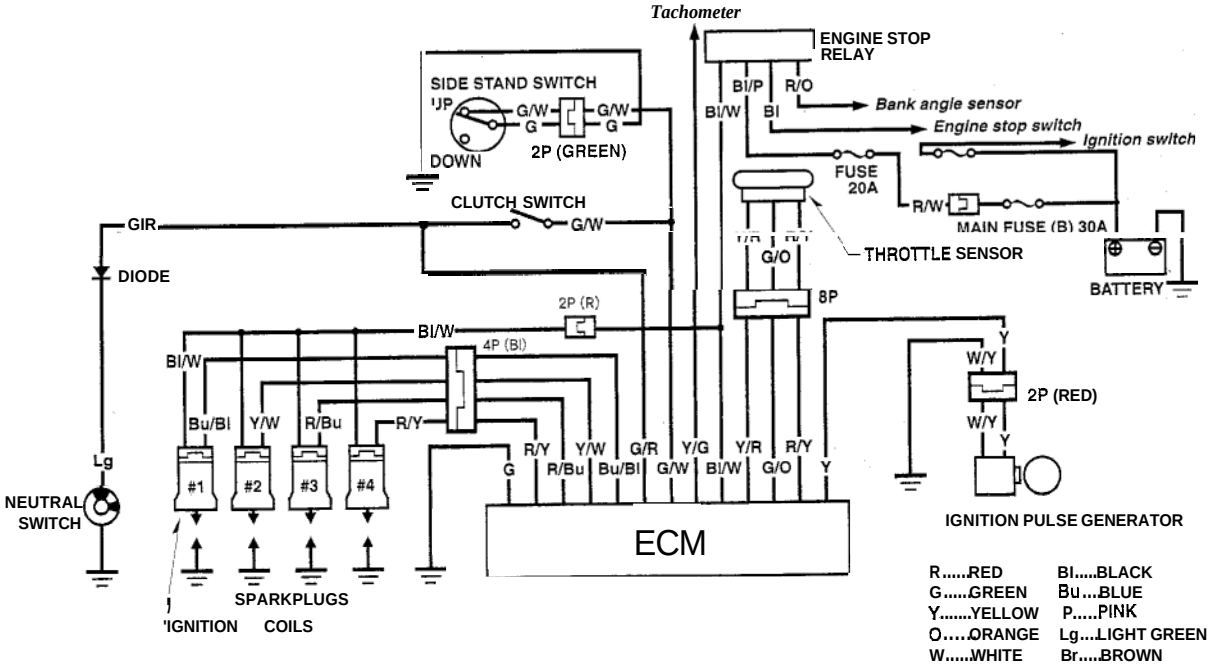
Install the regulator/rectifier unit in the reverse order of removal.

Route the regulator/rectifier wire in the seat rail properly (page 1-34)



SYSTEM DIAGRAM





17. IGNITION SYSTEM

SYSTEM DIAGRAM	17-0	IGNITION SYSTEM INSPECTION	17-4
SERVICE INFORMATION	17-1	IGNITION PULSE GENERATOR	17-6
TROUBLESHOOTING	17-3	IGNITION TIMING	17-8

SERVICE INFORMATION

GENERAL

- Some electrical components may be damaged if terminals or connectors are connected or disconnected while the ignition switch is turned to "ON" and current is present.
- When servicing the ignition system, always follow the steps in the troubleshooting sequence on page 17-3.
- This motorcycle's Ignition Control Module (ICM) is built into the Engine Control Module (ECM).
- The ignition timing does not normally need to be adjusted since the ECM is factory preset.
- The ECM may be damaged if dropped. Also if the connector is disconnected when current is flowing, the excessive voltage may damage the module. Always turn off the ignition switch before servicing.
- A faulty ignition system is often related to poor connections. Check those connections before proceeding. Make sure the battery is adequately charged. Using the starter motor with a weak battery results in a slower engine cranking speed as well as no spark at the spark plug.
- Use spark plugs of the correct heat range. Using spark plugs with an incorrect heat range can damage the engine.
- The direct ignition coil that the ignition coil and spark plug cap are integrated, is adopted in this motorcycle.
- Refer to section 5 for Throttle Position (TP) sensor, cam pulse generator and ECM inspection.

SPECIFICATIONS

ITEM		SPECIFICATIONS
Spark plug	Standard	IMR9C-9H (NGK), VUH27D (DENSO)
	Optional	IMR8C-9H (NGK), VUH24D (DENSO)
Spark plug gap		0.8 – 0.9 mm (0.03 – 0.04 in)
Ignition coil peak voltage		100 V minimum
Ignition pulse generator peak voltage		0.7 V minimum
Ignition timing ("F" mark)		13° BTDC at idle

TORQUE VALUES

Timing hole cap	18 N•m (1.8 kgf•m, 13 lbf•ft)	Apply grease to the threads.
Spark plug	12 N•m (1.2 kgf•m, 9 lbf•ft)	
Ignition pulse generator rotor special bolt	59 N•m (6.0 kgf•m, 43 lbf•ft)	Apply oil to the threads.

TOOLS

IgnitionMate peak voltage tester (U.S.A. only) or Peak voltage adaptor	07HGJ-0020100 (not available in U.S.A.) with commercially available digital multimeter (impedance 10 MΩ/DCV minimum)

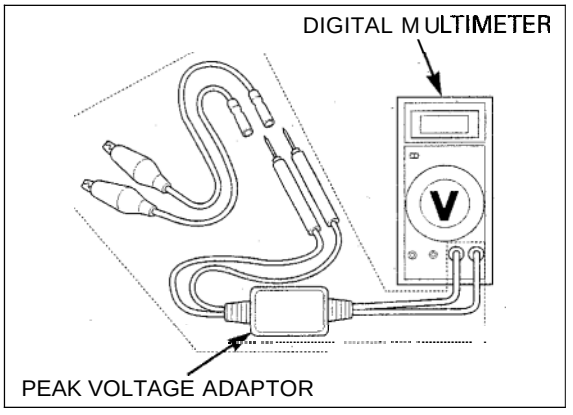
TROUBLESHOOTING

- Inspect the following before diagnosing the system.
  - Faulty spark plug
  - Loose spark plug cap or spark plug wire connection
  - Water got into the direct ignition coil (leaking the ignition coil secondary voltage)
- If there is no spark at either cylinder, temporarily exchange the direct ignition coil with a known-good one and perform the spark test. If there is spark, the exchanged direct ignition coil is faulty.
- "Initial voltage" of the ignition primary coil is the battery voltage with the ignition switch turned to "ON" and engine stop switch at RUN (The engine is not cranked by the starter motor).

No spark at all plugs

Unusual condition		Probable cause (Check in numerical order)
Ignition coil primary voltage	No initial voltage with ignition and engine stop switches on. (Other electrical components are normal)	1. Faulty engine stop switch and/or engine stop relay. 2. An open circuit in Black/White wire between the direct ignition coil and engine stop relay. 3. Loose or poor connect of the direct ignition coil primary wire terminal, or an open circuit in primary coil (Check at the ECM connector). 4. Faulty ECM (in case when the initial voltage is normal while disconnecting ECM connector)
	Initial voltage is normal, but it drops down to 2 – 4 V while cranking the engine.	1. Incorrect peak voltage adaptor connections. 2. Undercharged battery. 3. No voltage between the Black/White (+) and Body ground (–) at the ECM multi-connector or loosen ECM connection. 4. An open circuit or loose connection in Green wire. 5. An open circuit or loose connection in Blue/Black, Yellow/White, Red/Blue and Red/Yellow wires between the direct ignition coils and ECM. 6. Short circuit in ignition primary coil. 7. Faulty side stand switch or neutral switch. 8. An open circuit or loose connection in No.7 related circuit wires. • Side stand switch line: Green/White wire • Neutral switch line: Light Green and Green/Red wire 9. Faulty ignition pulse generator (measure the peak voltage). 10. Faulty ECM (in case when above No. 1 – 9 are normal).
	Initial voltage is normal, but no peak voltage while cranking the engine.	1. Faulty peak voltage adaptor connections. 2. Faulty peak voltage adaptor. 3. Faulty ECM (in case when above No.1, 2 are normal).
	Initial voltage is normal, but peak voltage is lower than standard value.	1. The multimeter impedance is too low; below 10 MΩ/DCV. 2. Cranking speed is too low (battery under-charged). 3. The sampling timing of the tester and measured pulse were not synchronized (system is normal if measured voltage is over the standard voltage at least once). 4. Faulty ECM (in case when above No. 1 – 3 are normal).
	Initial and peak voltage are normal, but does not spark.	1. Faulty spark plug or leaking ignition coil secondary current ampere. 2. Faulty ignition coil (s).
Ignition pulse generator	Peak voltage is lower than standard value.	1. The multimeter impedance is too low; below 10 MΩ/DCV. 2. Cranking speed is too low (battery under charged). 3. The sampling timing of the tester and measured pulse were not synchronized (system is normal if measured voltage is over the standard voltage at least once). 4. Faulty ECM (in case when above No. 1 – 3 are normal).
	No peak voltage.	1. Faulty peak voltage adaptor. 2. Faulty ignition pulse generator.

IGNITION SYSTEM INSPECTION

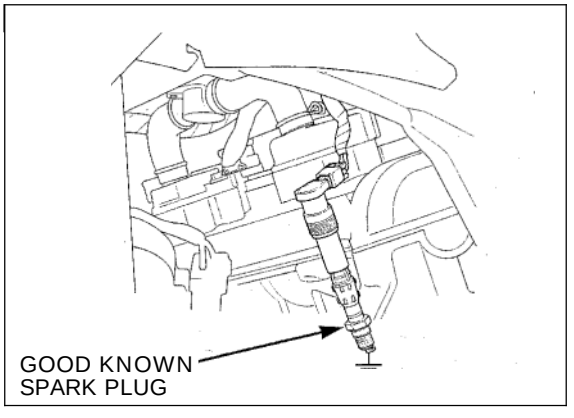


- If there is no spark at any plug, check all connections for loose or poor contact before measuring each peak voltage.
- Use recommended digital multimeter or commercially available digital multimeter with an impedance of 10 MΩ/DCV minimum.
- The display value differs depending upon the internal impedance of the multimeter.

Connect the peak voltage tester or peak voltage adaptor to the digital multimeter.

TOOLS:
IgnitionMate peak voltage tester (U.S.A. only) or
Peak voltage adaptor 07HGJ-0020100 (not available in U.S.A.)
with commercially available digital multimeter (impedance 10 MΩ/DCV minimum)

IGNITION COIL PRIMARY PEAK VOLTAGE

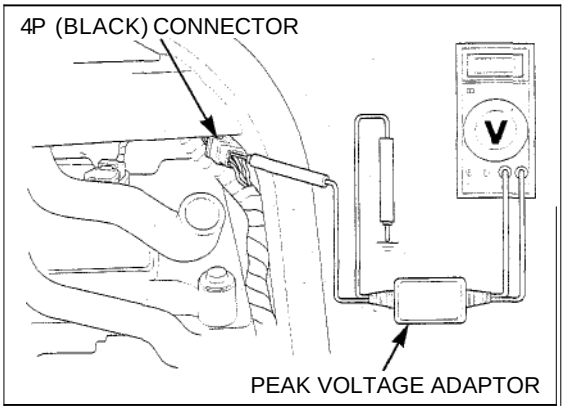


- Check all system connections before inspection. If the system is disconnected, incorrect peak voltage might be measured.
- Check cylinder compression and check that the spark plugs are installed correctly.

Disconnect the direct ignition coils from the spark plug (page 3-6).

Connect the direct ignition coil 2P connectors to the direct ignition coil.
Shift the transmission into neutral.
Connect a known good spark plugs to the direct ignition coils and ground the spark plugs to the cylinder head as done in a spark test.

With the ignition coil sub-harness 4P (Black) connector connected, connect the peak voltage adaptor or Imrie tester to the 4P (Black) connector primary wire terminal and ground.



CONNECTION:

No.1 coil:
Blue/Black terminal (+) **– Body ground (–)**
No.2 coil:
Yellow/White terminal (+) **– Body ground (–)**
No.3 coil:
Red/Blue terminal (+) **– Body ground (–)**
No.4 coil:
Red/Yellow terminal (+) **– Body ground (–)**

Avoidtouching the sparkplugs and tester probes to prevent electric shock

Turn the ignition switch to "ON" and engine stop switch to "RUN".
Check for initial voltage at this time.
The battery voltage should be measured.
If the initial voltage cannot be measured, check the power supply circuit (refer to the troubleshooting, page 17-3).

Crank the engine with the starter motor and read the ignition coil primary peak voltage.

PEAK VOLTAGE: 100V minimum

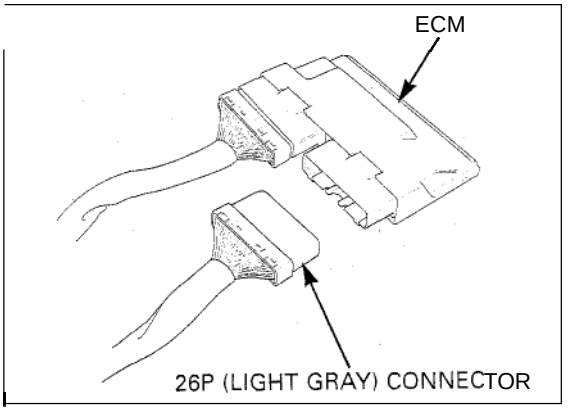
If the peak voltage is abnormal, check for an open circuit or poor connection in Blue/Black, Yellow/White, Red/Blue and Red/Yellow wires.
If no defects are found in the harness, refer to the troubleshooting chart on page 17-3.

IGNITION PULSE GENERATOR PEAK VOLTAGE

- Check all system connections before inspection. If the system is disconnected, incorrect peak voltage might be measured.
- Check cylinder compression and check that the spark plugs are installed correctly.

Remove the ECM cover (page 5-87).

Disconnect the 26P (Light gray) connector from the ECM.



Connect the peak voltage tester or peak voltage adaptor probes to the connector terminal of the wire harness side and ground.

TOOLS:
IgnitionMate peak voltage tester (U.S.A. only) or
Peak voltage adaptor 07HGJ-0020100 (not available in U.S.A.)
with commercially available digital multimeter (impedance 10 MΩ/DCV minimum)

CONNECTION:
Yellow terminal (+) – Ground (–)

Avoid touching the spark plugs and tester probes to prevent electric shock.

Crank the engine with the starter motor and read the peak voltage.

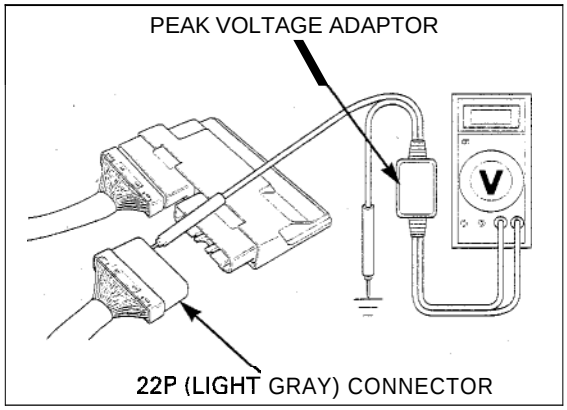
PEAK VOLTAGE: 0.7 V minimum

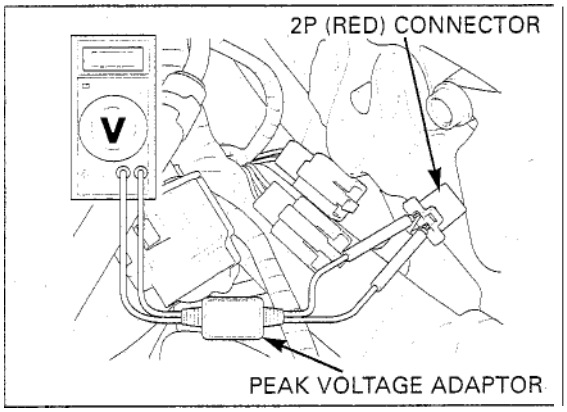
If the peak voltage measured at the ECM multi-connector is abnormal, measure the peak voltage at the ignition pulse generator connector.

Open and support the front end of the fuel tank (page 3-4).

Disconnect the ignition pulse generator 2P (Red) connector and connect the tester probes to the terminal (Yellow and White/Yellow).
In the same manner as at the ECM connector, measure the peak voltage and compare it to the voltage measured at the ECM connector.

- If the peak voltage measured at the ECM is abnormal and the one measured at the ignition pulse generator is normal, the wire harness has an open circuit or loose connection.
- If both peak voltages are abnormal, check each item in the troubleshooting chart. If all items are normal, the ignition pulse generator is faulty. See following steps for ignition pulse generator replacement.



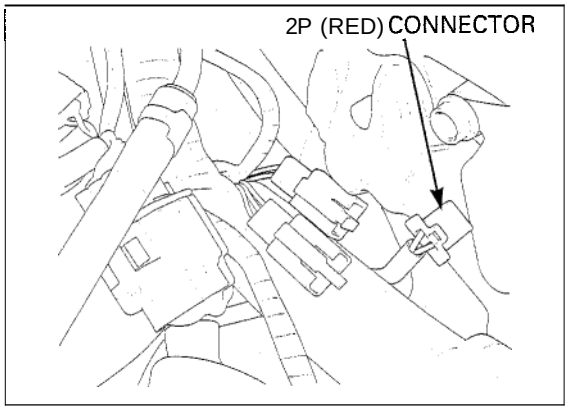


IGNITION PULSE GENERATOR

REMOVAL

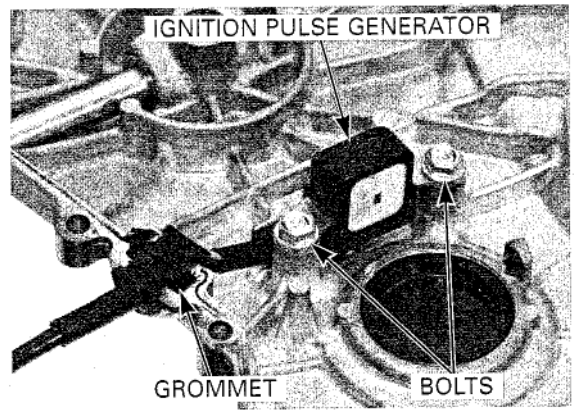
Open and support the front end of the fuel tank (page 3-4).

Disconnect the ignition pulse generator 2P (Red) connector.



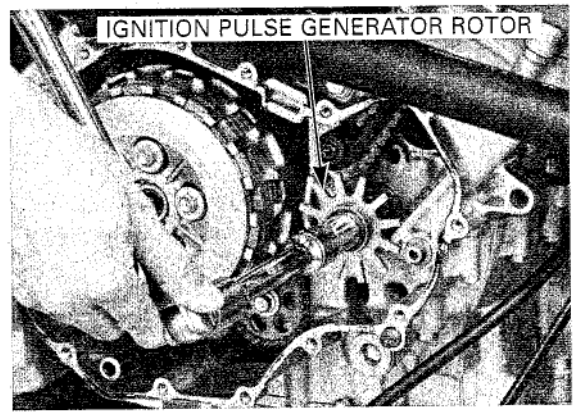
Remove the right crankcase cover (page 9-3).

Remove the wire grommet from the cover.
Remove the bolts and ignition pulse generator.



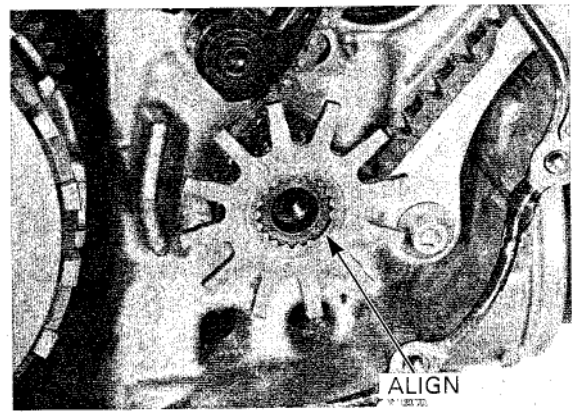
If the engine is out of the frame, remove the alternator cover (page 10-2) and hold the flywheel with the flywheel holder (07725–0040000), then remove the bolt.

Shift the transmission into 6th gear and apply the rear brake.
Remove the ignition pulse generator rotor special bolt.

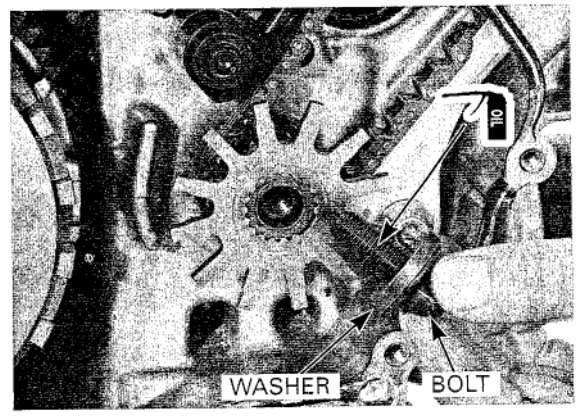


INSTALLATION

Install the ignition pulse generator rotor by aligning the wide groove with the wide teeth of the crankshaft.



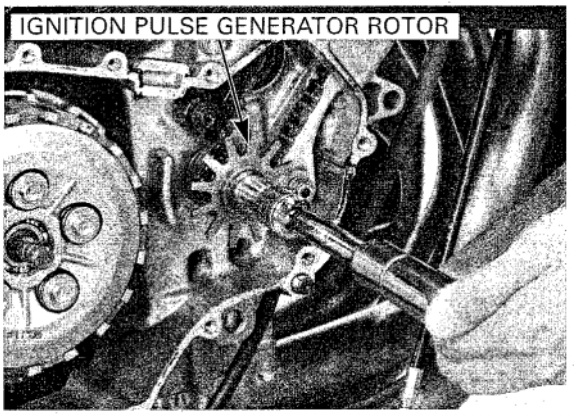
Apply oil to the ignition pulse generator rotor bolt threads, then install the washer and rotor bolt.



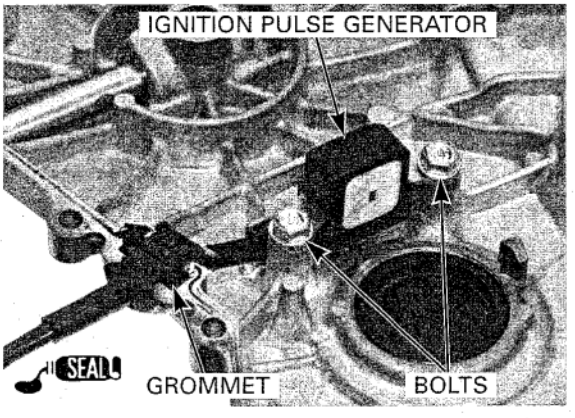
iftheengines out of the frame, hold the flywheel with the flywheel hoider (07725–0040000), then tighten the bolt

Shift the transmission into 6th gear and apply rear brake.
Tighten the ignition pulse generator rotor special bolt to the specified torque.

TORQUE: 59 N•m *(6.0* kgf•m, *43* lbf•ft)



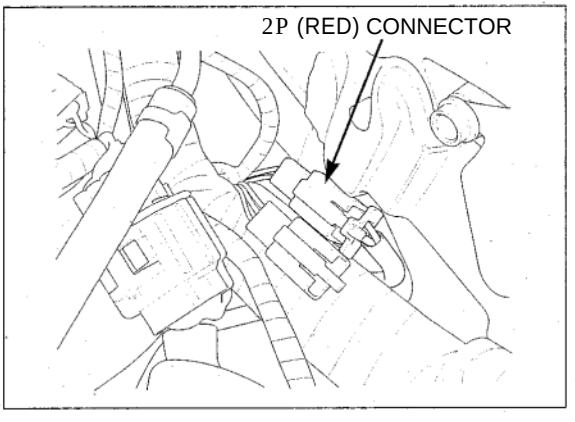
Install the ignition pulse generator into the cover.
Apply sealant to the wire grommet, then install it into the groove of the cover.
Install and tighten the ignition pulse generator bolts.



Install the right crankcase cover (page 9-17)

Route the ignition pulse generator wire properly, connect the 2P (Red) connector.

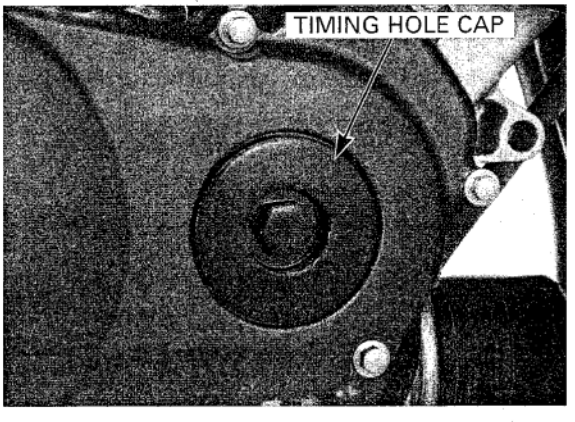
Install the removed parts in the reverse order *of* removal.



IGNITION TIMING

Remove the lower cowl (page 2-7).

Warm up the engine.
Stop the engine and remove the timing hole cap.

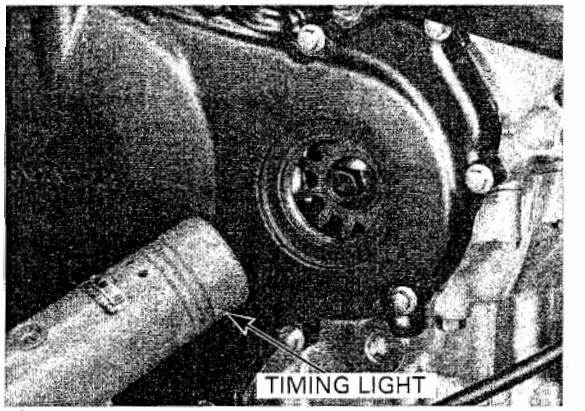


Read the instructions for timing light operation

Connect the timing light to the No.1 direct ignition coil wire.

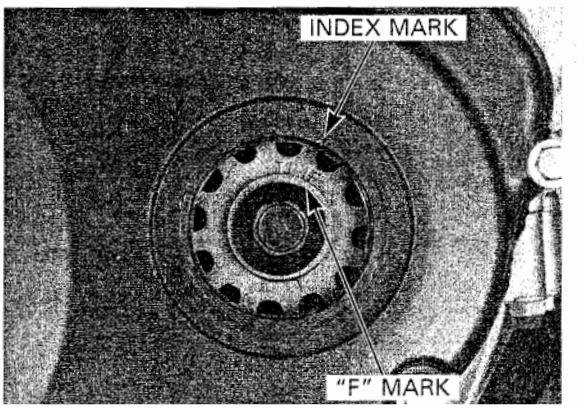
Start the engine and let it idle.

IDLE SPEED: 1,200 ± 100 rpm

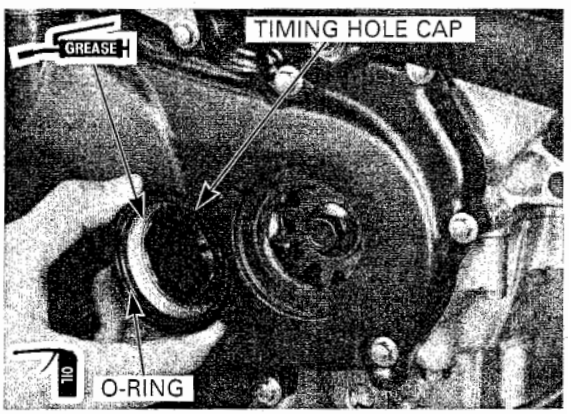


The ignition timing is correct if the "F" mark aligns with the index mark on the ignition pulse generator rotor cover.

Increase the engine speed by turning the throttle stop screw and make sure the "F" mark begins to move counterclockwise when the engine speed at approximately 1,500 rpm.



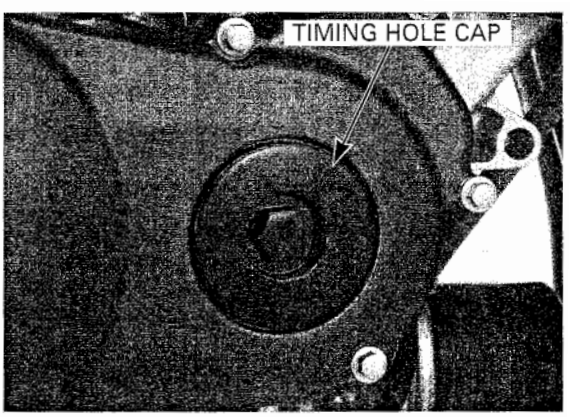
Check that the O-ring is in good condition, replace if necessary.
Apply oil to the O-ring.
Apply grease to the timing hole cap threads and install the O-ring and timing hole cap.



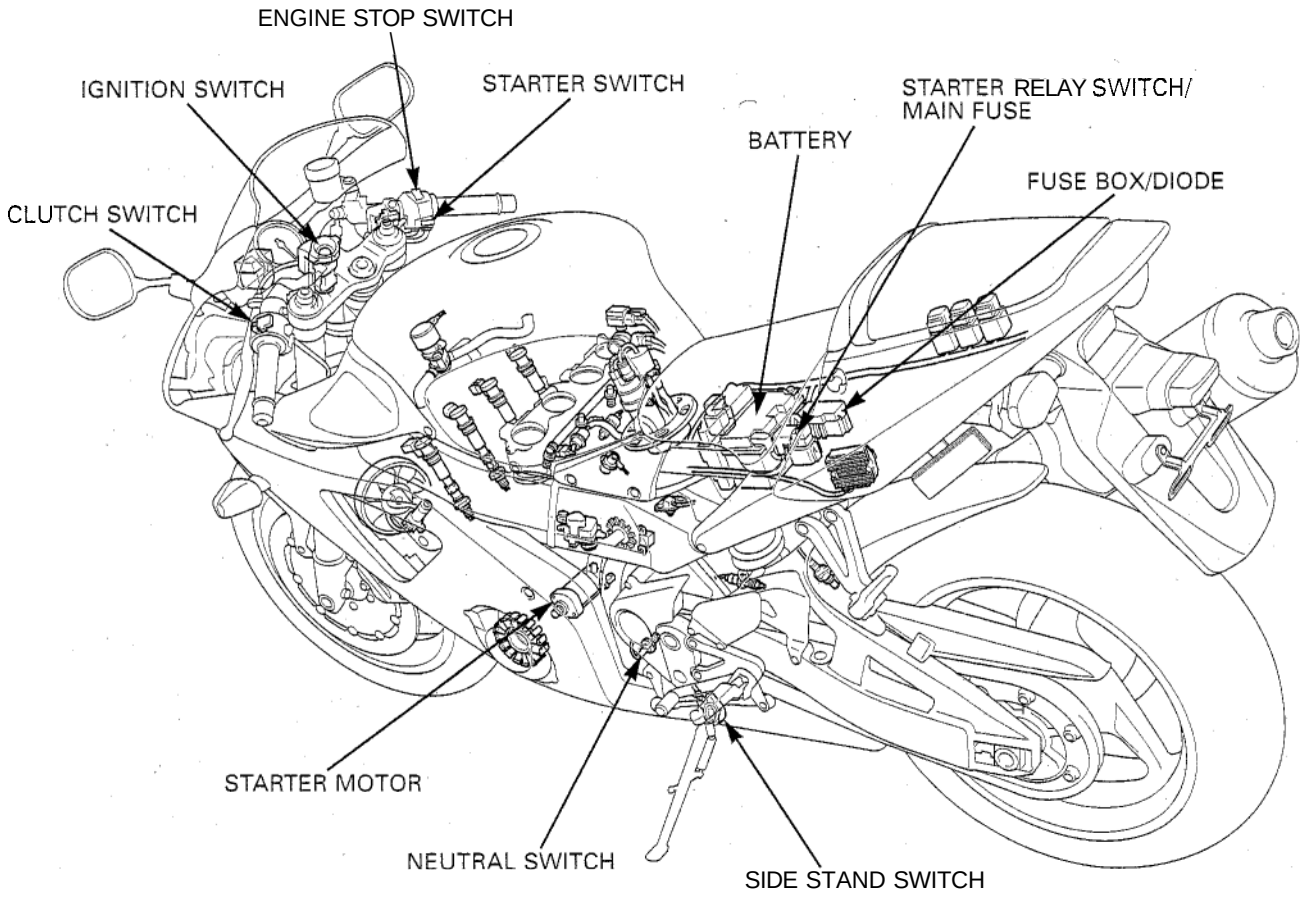
Tighten the timing hole cap to the specified torque.

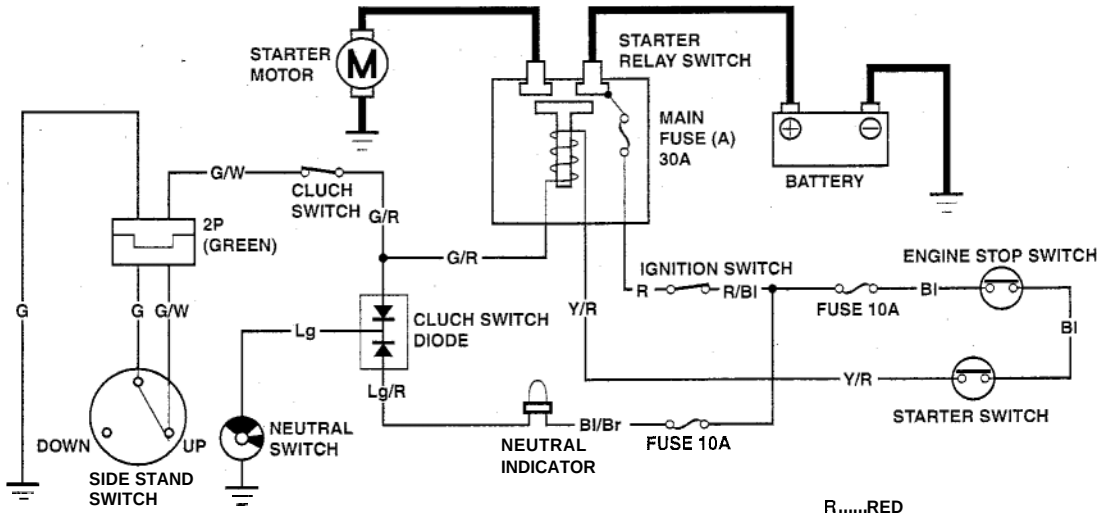
TORQUE: 18 N·m (1.8kgf·m, 13 lbf·ft)

Install the lower cowl (page 2-7).



SYSTEM DIAGRAM





R.....RED
G.....GREEN
Y.....YELLOW
W.....WHITE
Bl.....BLACK
Bu....BLUE
Br.....BROWN
Lg....LIGHT GREEN

18. ELECTRIC STARTER

SYSTEM DIAGRAM	18-0	STARTER MOTOR	18-4
SERVICE INFORMATION	18-1	STARTER RELAY SWITCH	18-10
TROUBLESHOOTING	18-2	DIODE	18-11

SERVICE INFORMATION

GENERAL

- Always turn the ignition switch to "OFF" before servicing the starter mo or. The motor ould sudd nly st rt, ausing s rious injury.
- When checking the starter system, always follow the steps in the troubleshooting flow chart (page 18-2).
- A weak battery may be unable to turn the starter motor quickly enough, or supply adequate ignition current.
- If the current is kept flowing through the starter motor to turn it while the engine is not cranking over, the starter motor may be damaged.
- See section 10 for starter clutch servicing.
- See section 19 for following components:
  - Ignition switch
  - Engine stop switch
  - Starter switch
  - Neutral switch
  - Side stand switch
  - Clutch switch

SPECIFICATION

Unit: mm (in)

ITEM	STANDARD	SERVICE LIMIT
Starter motor brush length	10.0 – 10.5 (0.39 – 0.41)	3.5 (0.14)

TORQUE VALUE

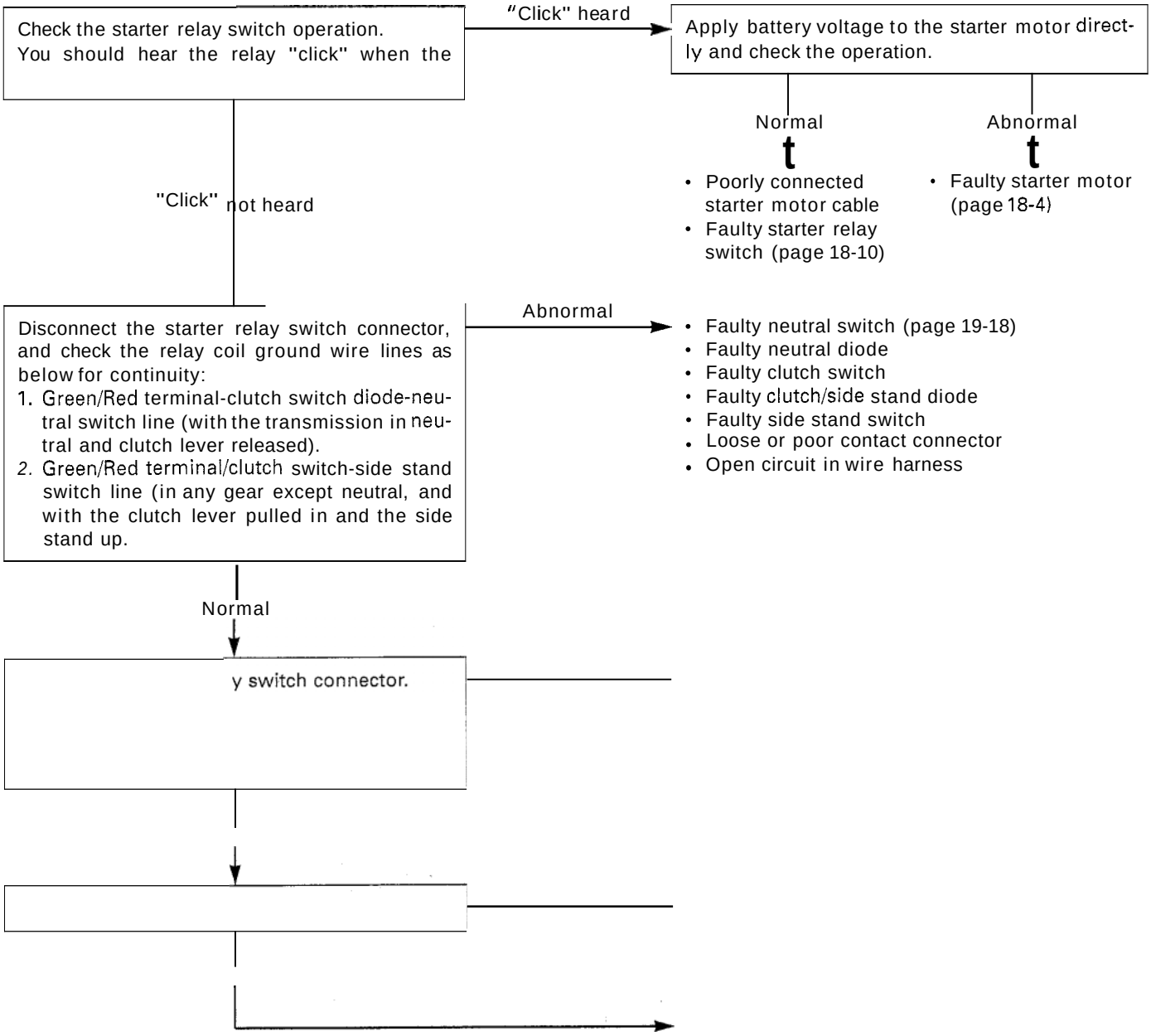
Starter motor terminal nut	12 N•m (1.2 kgf•m, 9 lbf•ft)

18

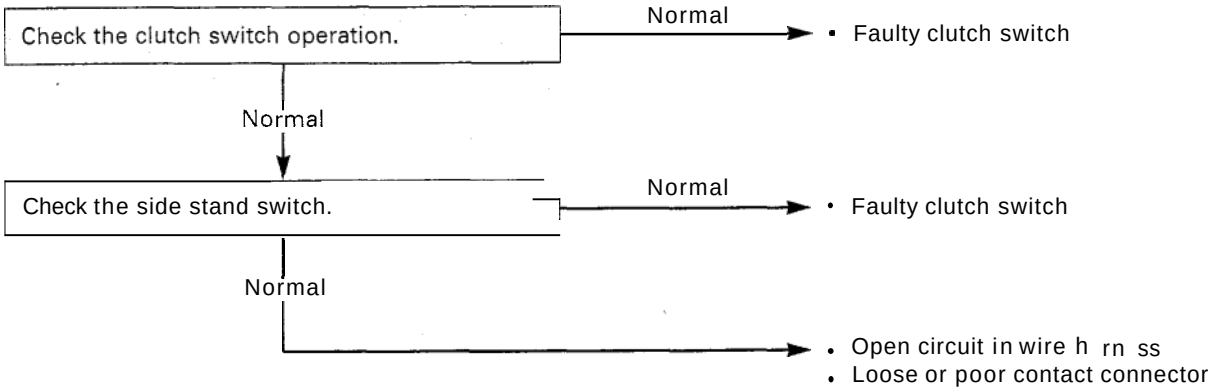
TROUBLESHOOTING

Starter motor does not turn

- Check for blown main or sub fuses before servicing.
- Make sure the battery is fully charged and in good condition.



The starter motor turns when the transmission is in neutral, but does not turn with the transmission in any position except neutral, with the side stand up and the clutch lever pulled in.



Starter motor turns engine slowly

- Low battery voltage
- Poorly connected battery terminal cable
- Poorly connected starter motor cable
- Faulty starter motor
- Poor connected battery ground cable

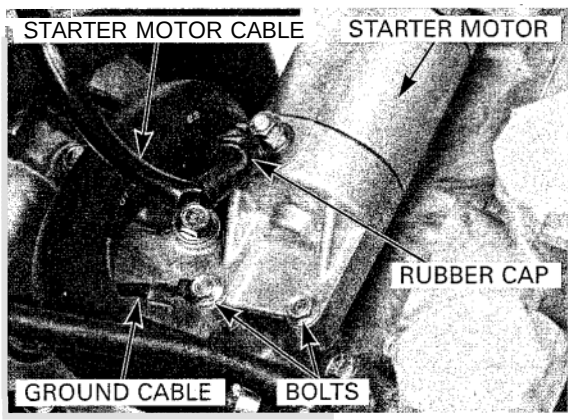
Starter motor turns, but engine does not turn

- Starter motor is running backwards
  - Case assembled improperly
  - Terminals connected improperly
- Faulty starter clutch
- Damaged or faulty starter drive gear

Starter relay switch "clicks", but engine does not turn over

- Crankshaft does not turn due to engine problems

STARTER MOTOR



REMOVAL

Drain the coolant (page 6-4).
Remove the throttle body (page 5-67).
Remove the thermostat housing (page 6-7).

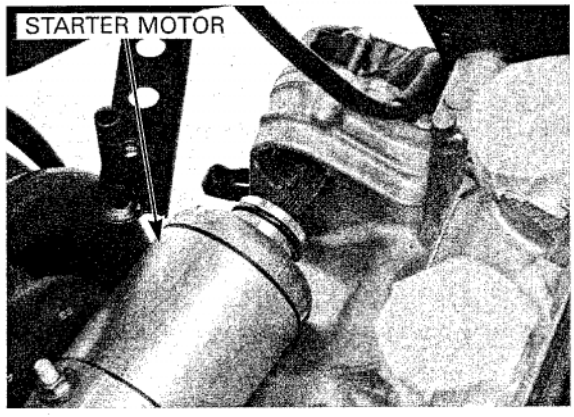
With the ignition switch turned to "OFF", remove the negative cable at the battery before servicing the starter motor.

Remove the rubber cap.

Be careful not to damage the water hose.

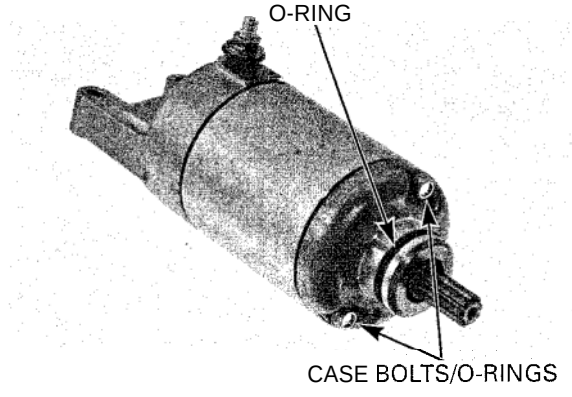
Remove the nut and the starter motor cable from the starter motor.
Remove the starter motor mounting bolts and ground cable.

Pull the starter motor out of the crankcase.



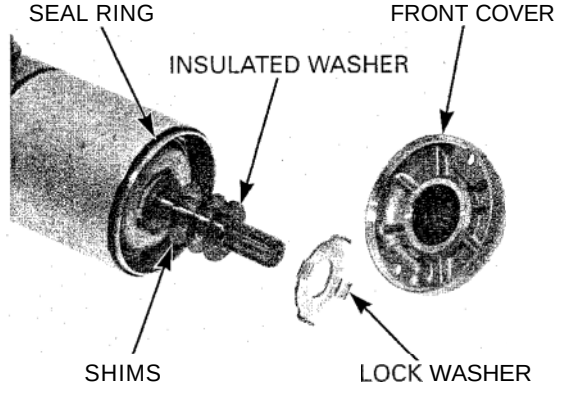
DISASSEMBLY

Remove the following:
- O-ring
- Starter motor case bolts/O-rings



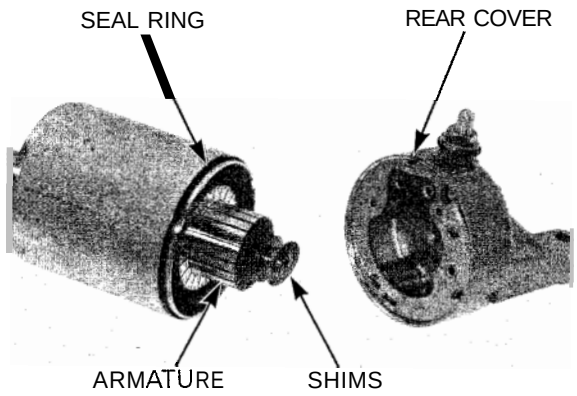
- Front cover
- Seal ring
- Lockwasher
- Insulated washer
- Shim(s)

Record the location and number of shims.



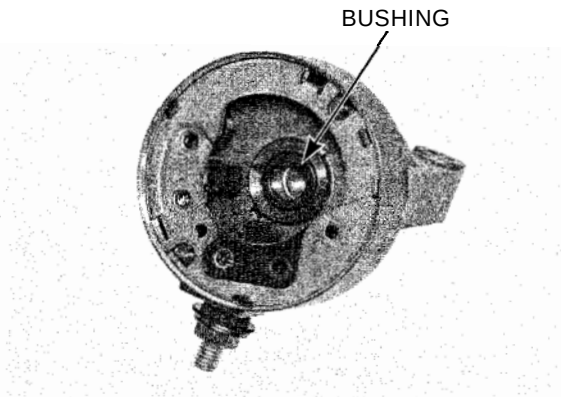
Remove the following:
- Rear cover assembly
- Seal ring
- Shims
- Armature

Record the location and number of shims

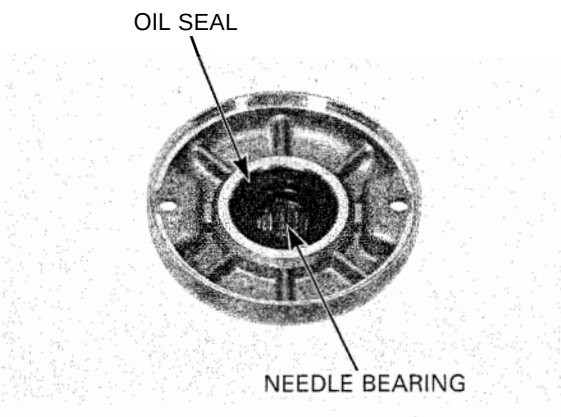


INSPECTION

Check the bushing in the rear cover for wear or damage.

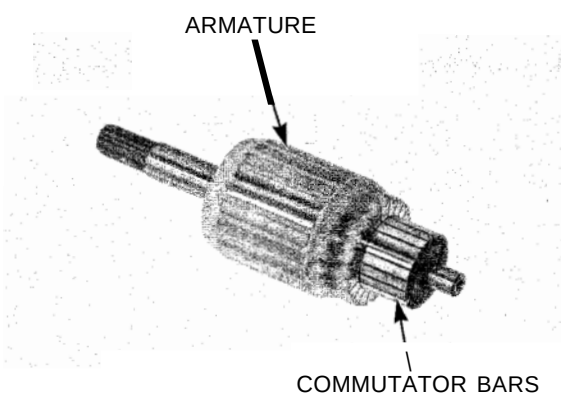


Check the oil seal and needle bearing in the front cover for deterioration, wear or damage.

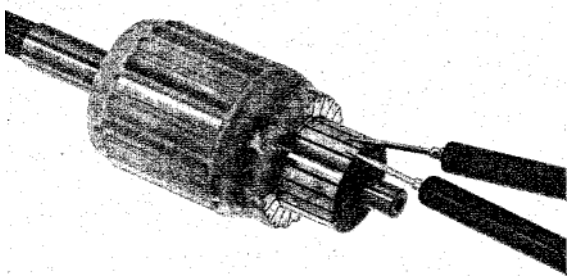


Do not use emery or sandpaper on the commutator

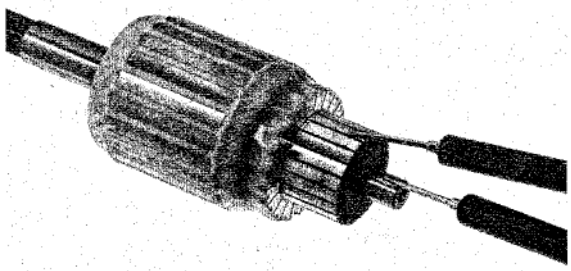
Check the commutator bars of the armature for discoloration.



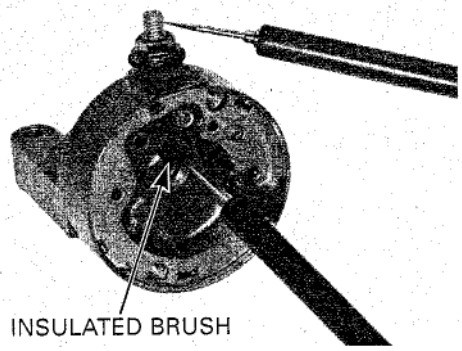
Check for continuity between pairs of commutator bars.
There should be continuity.



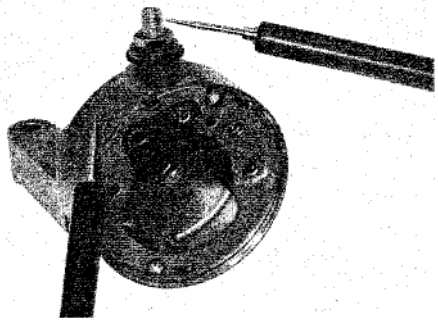
Check for continuity between each commutator bar and the armature shaft.
There should be no continuity.



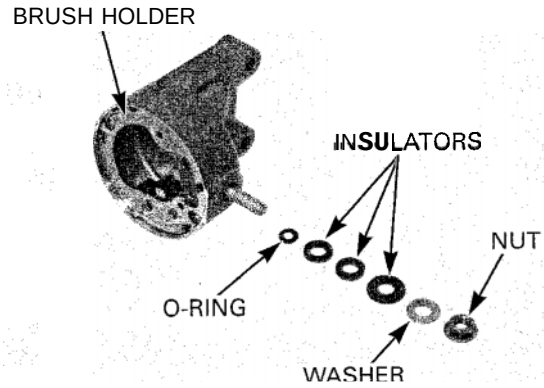
Check for continuity between the insulated brush and cable terminal (the indigo colored wire or the insulated brush holder).
There should be continuity.



Check for continuity between the cable terminal and the rear cover.
There should be no continuity.

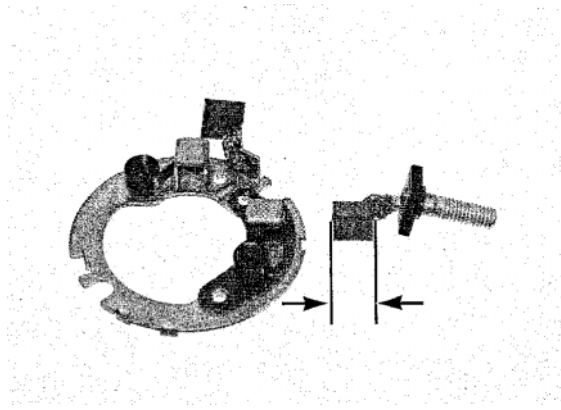


Remove the following:
- Nut
- Washer
- Insulators
- O-ring
- Brush holder assembly
- Brush/terminal

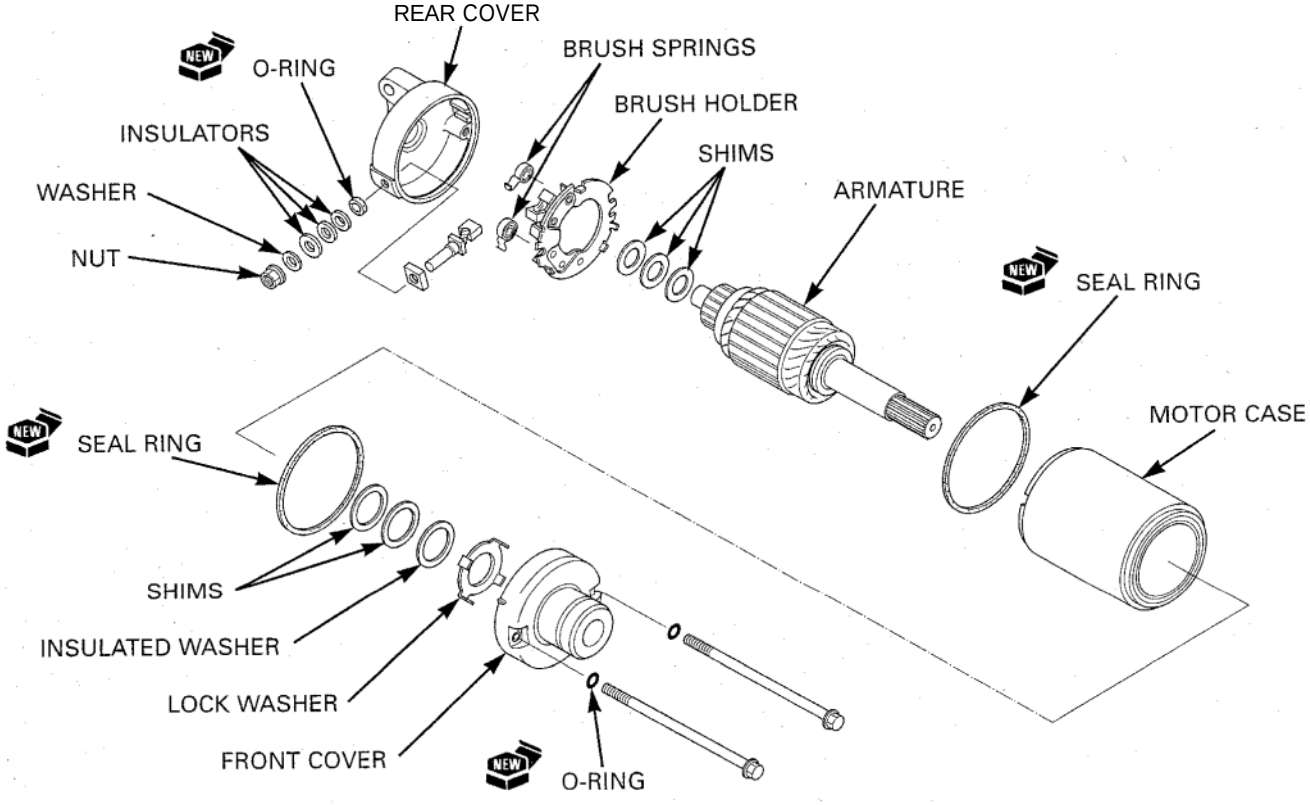


Inspect the brushes for damage and measure the brush length.

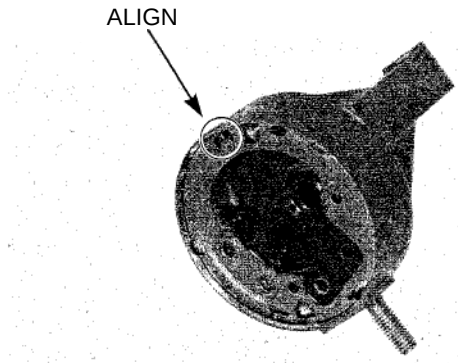
SERVICE LIMIT: 3.5 mm (0.14 in)



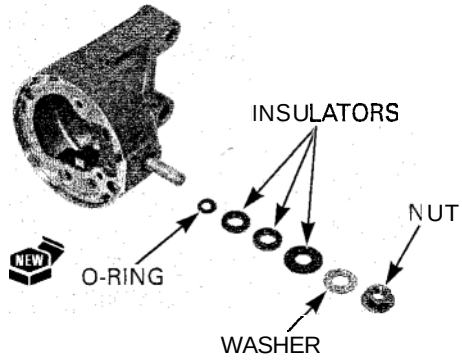
ASSEMBLY



Install the brushes into the brush holder.
Install the cable terminal and brush holder into the rear cover, aligning the holder tab with the rear cover groove.



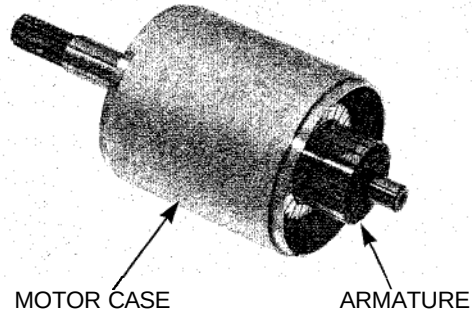
Install the following:
- New O-ring
- Insulators
- Washer
- Nut



Install the armature in the motor case.
When installing the armature into the motor case, hold the armature tightly to keep the magnet of the case from pulling the armature against it.

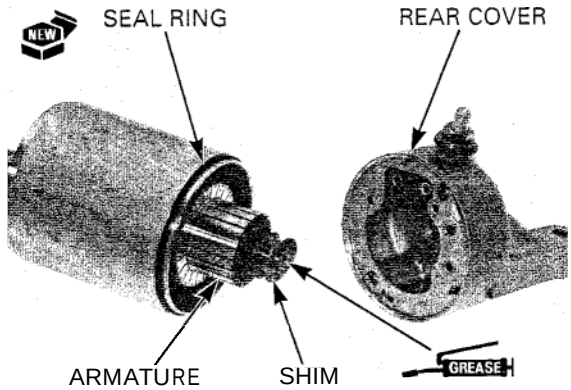
NOTICE

The coil may be damaged if the magnet pulls the armature against the case.



Install the same number of shims in the same location as noted during disassembly.
Install a new seal ring onto the motor case.
Apply a thin coat of grease to the armature shaft end.

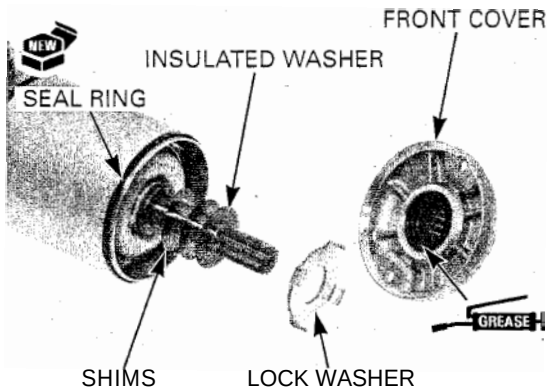
Install the rear cover, while pushing in the brushes into the brush holder and aligning the brush holder tab with the motor case groove.



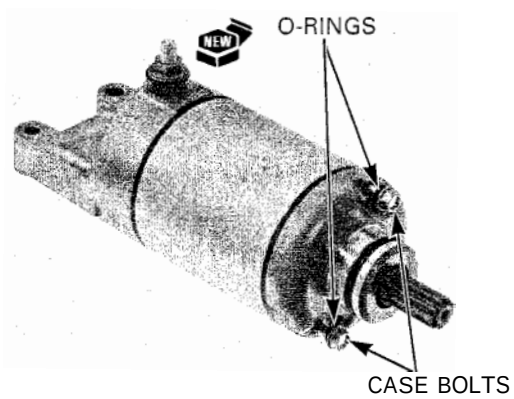
Install the insulators properly as noted during removal.

Install the shims and insulated washer onto the armature shaft.
Install a new seal ring onto the motor case.
Apply grease to the oil seal lip and needle bearing in the front cover.

Install the lock washer onto the front cover.
Install the front cover.



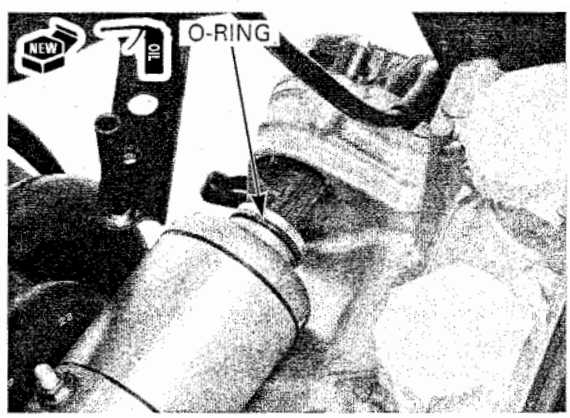
Install the new O-rings onto the motor case bolts.
Install and tighten the case bolts securely.



INSTALLATION

Coat a new O-ring with oil and install it into the starter motor groove.

Install the starter motor into the crankcase.

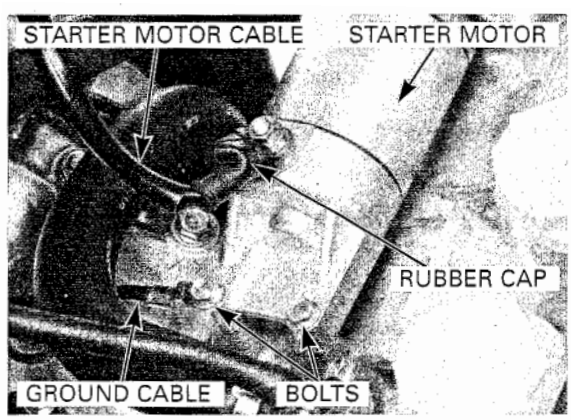


Be careful not to damage the water hose.

Route the starter motor cable and ground cable.
Install the ground cable and mounting bolts, and tighten the bolts securely.
Install the starter motor cable, then tighten the terminal nut to the specified torque

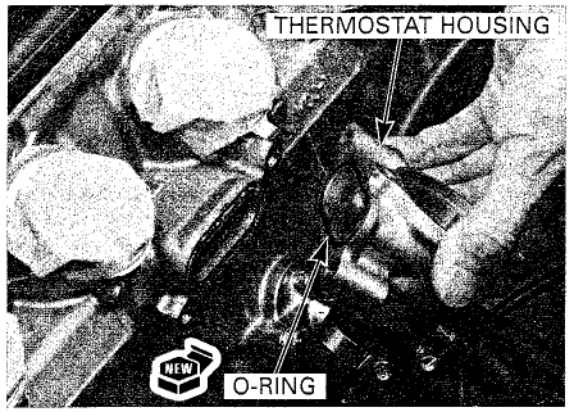
TORQUE: 12 N·m (1.2 kgf·m, 9 lbf·ft)

Install the rubber cap securely.



Install a new O-ring into the thermostat housing groove.

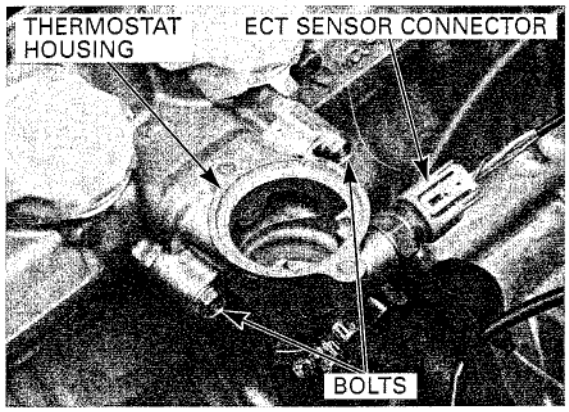
Install the thermostat housing to the cylinder head.



Install and tighten the mounting bolts.

Install the following:
– Thermostat housing/thermostat (page 6-7).
– Throttle body (page 5-71).

Fill the system with the recommended coolant (page 6-5).



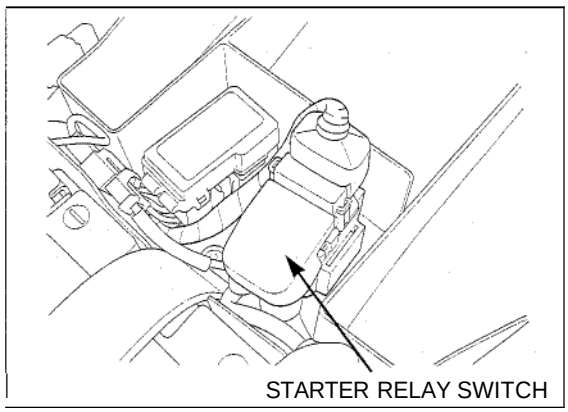
STARTER RELAY SWITCH

OPERATION INSPECTION

Remove the seat (page 2-2).

Shift the transmission into neutral.
Turn the ignition switch to "ON" and engine stop switch to "RUN".
Push the starter switch button.
The coil is normal if the starter relay switch clicks.

If you don't hear the switch "click", inspect the relay switch using the procedure below.

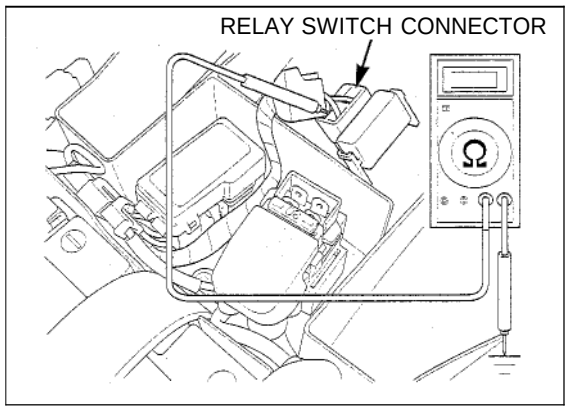


GROUND LINE INSPECTION

Disconnect the relay switch connector.

Check for continuity between the Green/Red wire (ground line) terminal and ground.

If there is continuity when the transmission is in neutral or when the clutch is disengaged and the side stand switch is retracted, the ground circuit is normal (in neutral, there is a slight resistance due to the diode).

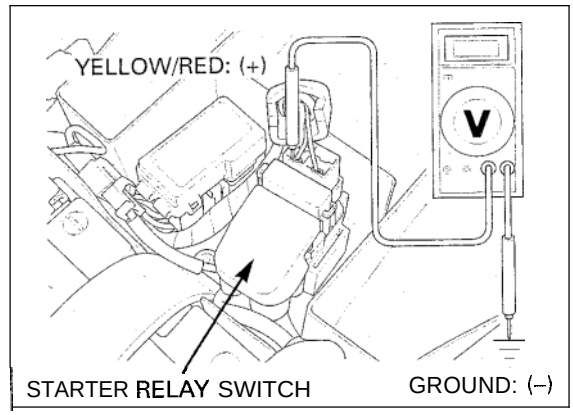


STARTER RELAY VOLTAGE INSPECTION

Connect the starter relay switch connector.

Shift the transmission into neutral.
Measure the voltage between the Yellow/Red wire terminal (+) and ground (–).

If the battery voltage appears only when the starter switch is pushed with the ignition switch to "ON" and engine stop switch at "RUN", it is normal.

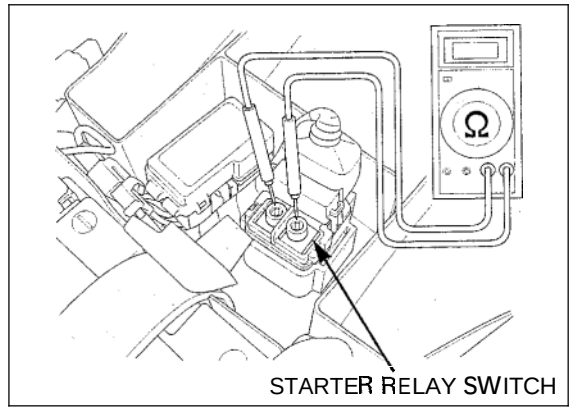


CONTINUITY INSPECTION

Disconnect the starter relay cables.

Connect an ohmmeter to the starter relay switch large terminals.
Turn the ignition switch to "ON" and the engine stop switch to "RUN".
Check for continuity between the starter relay switch terminals.

There should be continuity while the starter switch is pushed and should be no continuity when the starter switch is released.

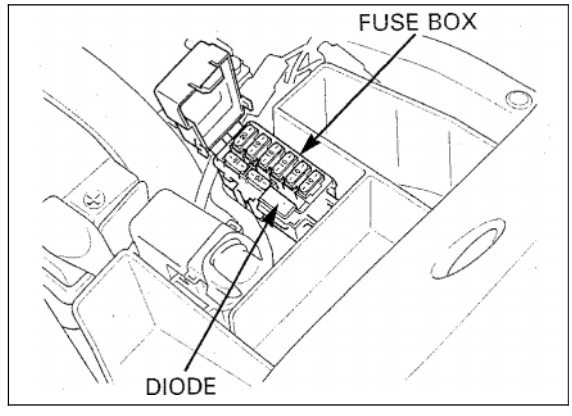


DIODE

REMOVAL

Remove the seat (page 2-2).

Open the fuse box and remove the diode.



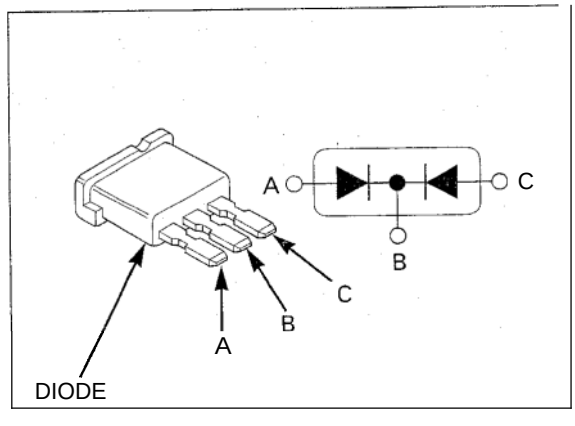
INSPECTION

Check for continuity with an ohmmeter.

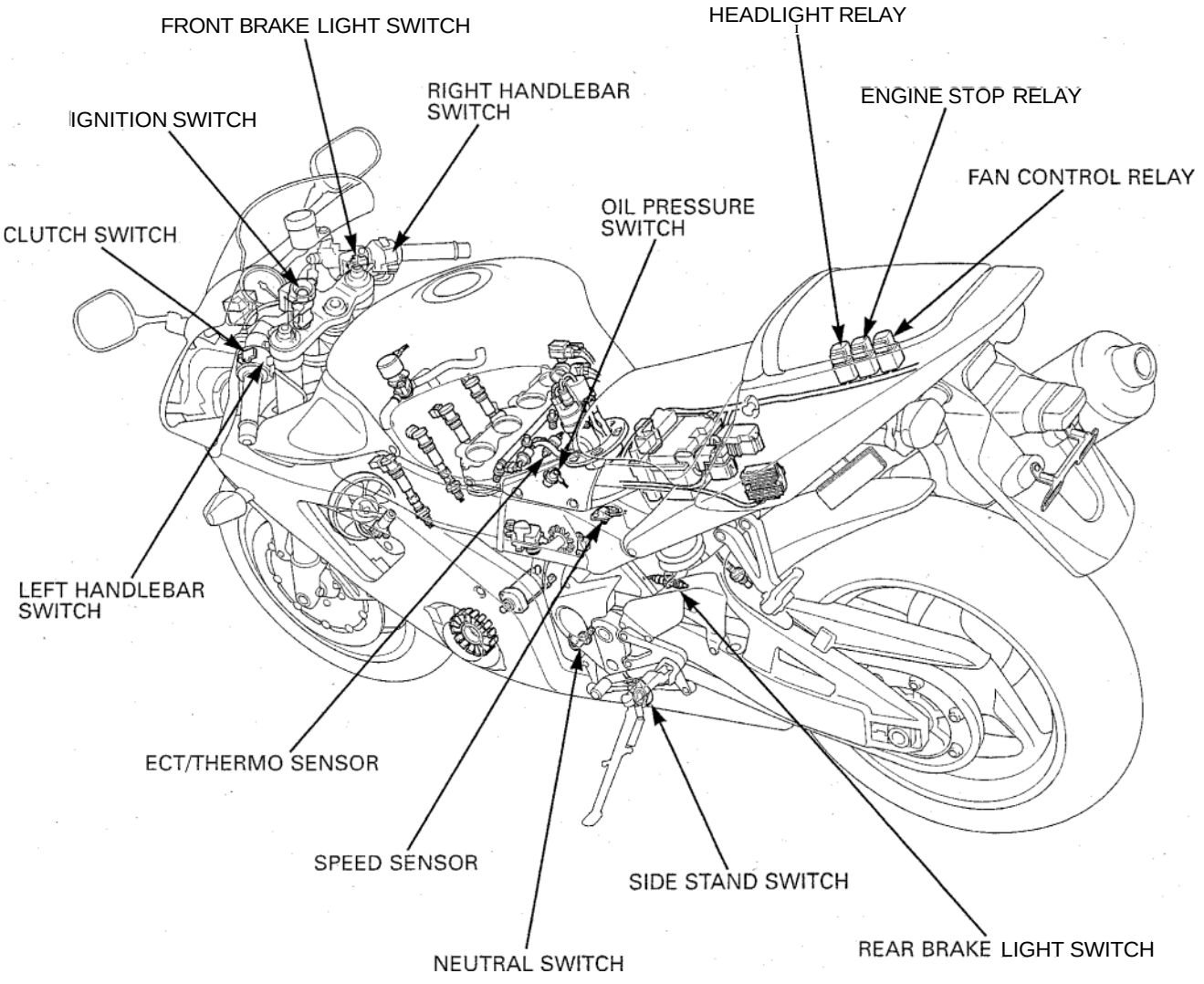
Normal direction: Continuity
Reverse direction: No continuity

INSTALLATION

Install the diode in the reverse order of removal.



SYSTEM LOCATION



19. LIGHTS/METERS/SWITCHES

SYSTEM LOCATION	19-0	OIL PRESSURE SWITCH	19-14
SERVICE INFORMATION	19-1	FUEL RESERVE SENSOR	19-15
TROUBLESHOOTING	19-3	IGNITION SWITCH	19-16
HEADLIGHT	19-4	HANDLEBAR SWITCHES	19-17
TURN SIGNAL	19-6	BRAKE LIGHT SWITCH	19-18
BRAKE/TAIL LIGHT	19-6	CLUTCH SWITCH	19-18
LICENSE LIGHT	19-7	NEUTRAL SWITCH	19-18
COMBINATION METER	19-7	SIDE STAND SWITCH	19-19
SPEEDOMETER/VEHICLE SPEED SENSOR	19-9	HORN	19-20
TACHOMETER	19-12	TURN SIGNAL RELAY	19-21
ECT/THERMO SENSOR	19-12		

SERVICE INFORMATION

GENERAL

NOTICE

- *A halogen headlight bulb becomes very hot while the headlight is on, and remains hot for a while after it is turned off. Be sure to let it cool down before servicing.*
- *Note the following when replacing the halogen headlight bulb.*
  - *Wear clean gloves while replacing the bulb. Do not put finger prints on the headlight bulb, as they may create hot spots on the bulb and cause is to fail.*
  - *If you touch the bulb with your bare hands, clean it with a cloth moistened with alcohol to prevent its early failure.*
  - *Be sure to install the dust cover after replacing the bulb.*

- Use an electric heating element to heat the water/coolant mixture for the ECT/thermo sensor inspection. Keep flammable materials away from the electric heating element. Wear protective clothing, insulated gloves and eye protection.
- Check the battery condition before performing any inspection that requires proper battery voltage.
- A continuity test can be made with the switches installed on the motorcycle.
- The following color codes are used throughout this section.

Bu = Blue	G = Green	Lg = Light Green	R = Red
Bl = Black	Gr = Gray	O = Orange	W = White
Br = Brown	Lb = Light Blue	P = Pink	Y = Yellow

SPECIFICATIONS

ITEM			SPECIFICATIONS
Bulbs	Headlight	Hi	12v – 55w x 2
		Lo	12V – 55W
	Brake/tail light		LED
	Front turn signal light		12V – 32/3cp (23/8W) x 2
	Rear turn signal light		12V – 32cp (23W) x 2
	License light		12V – 5W
	Instrument light		LED
	Turn signal indicator		LED x 2
	High beam indicator		LED
	Neutral indicator		LED
	Oil pressure indicator		LED
	Malfunction indicator lamp		LED
	Fuel reserve indicator		LED
	Main fuse		30 A
	PGM-FI fuse		20 A
	Sub fuse		20A x 2, 10A x 3
Tachometer peak voltage			10.5V minimum
Thermo sensor resistance		80 °C (176 °F)	2.1 – 2.6 kΩ
		120 °C (248 °F)	0.65 – 0.73 kΩ

TORQUE VALUES

Ignition switch mounting one-way bolt	26 N•m (2.7 kgf•m, 20 lbf•ft)	
Side stand switch mounting bolt	10 N•m (1.0 kgf•m, 7 lbf•ft)	ALOC bolt
ECT/thermo sensor	23 N•m (2.3 kgf•m, 17 lbf•ft)	
Oil pressure switch	12 N•m (1.2 kgf•m, 9 lbf•ft)	Apply sealant to the threads.
Oil pressure switch wire terminal screw	2 N•m (0.2 kgf•m, 1.4 lbf•ft)	
Neutral switch	12 N•m (1.2 kgf•m, 9 lbf•ft)	

TOOLS

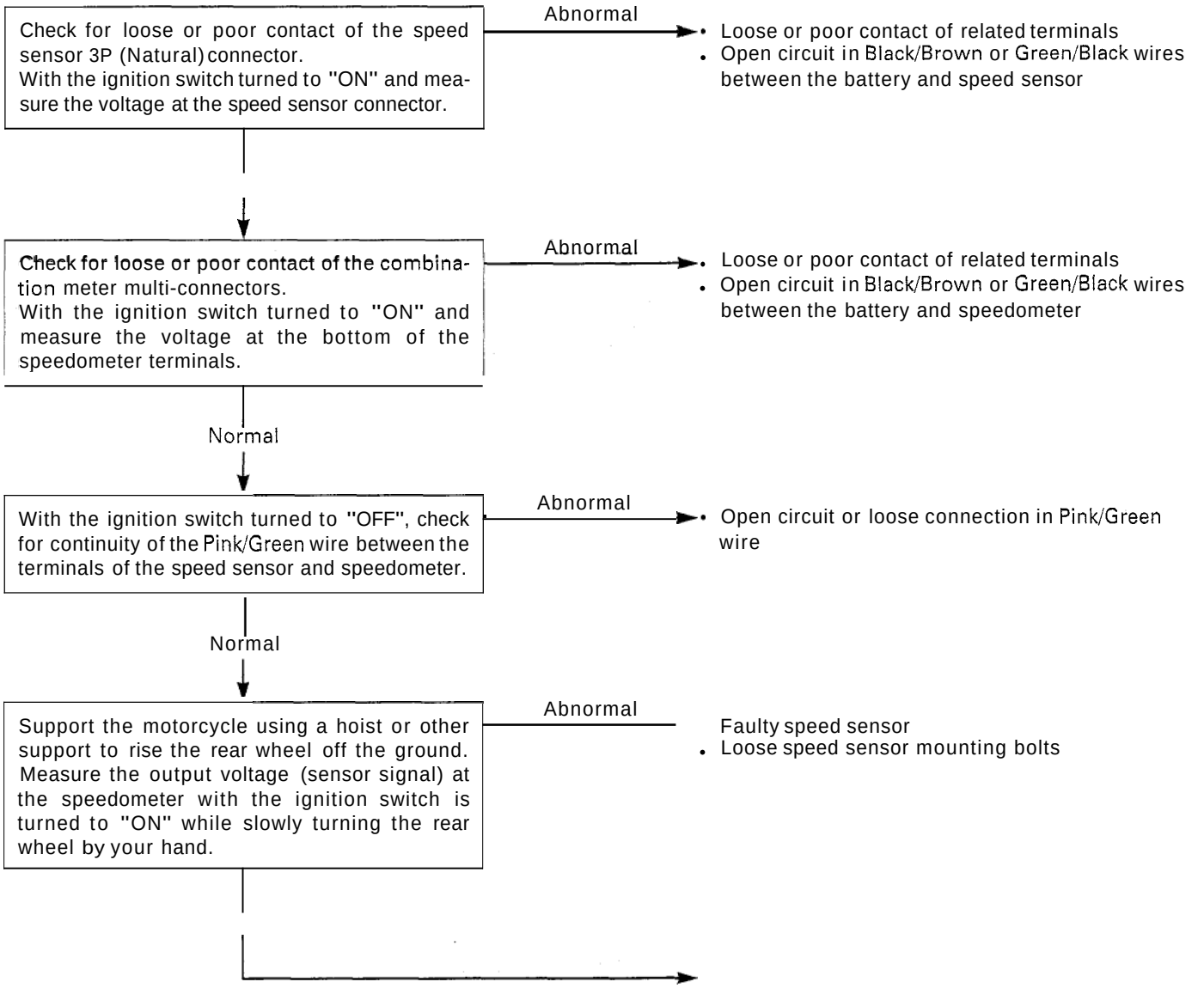
IgnitionMate peak voltage tester (U.S.A. only) or Peak voltage adaptor	07HGJ-0020100 (not available in U.S.A.) with commercially available digital multimeter (impedance 10 MΩ/DCV minimum)

TROUBLESHOOTING

SPEED SENSOR/SPEEDOMETER

The odometer/trip meter operates normally, but the speedometer does not operate
- Faulty speedometer

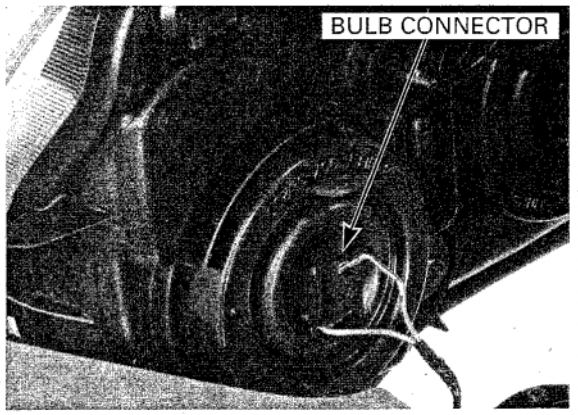
The speedometer operates normally, but the odometer/trip meter does not operate
- Faulty odometer/trip meter



HEADLIGHT

BULB REPLACEMENT

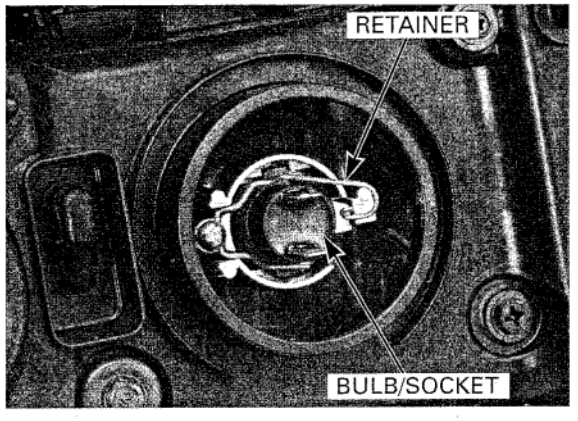
Disconnect the headlight bulb connector.
Remove the dust cover.



Avoid touching the halogen headlight bulb Finger prints can create hot spots that cause a bulb to break

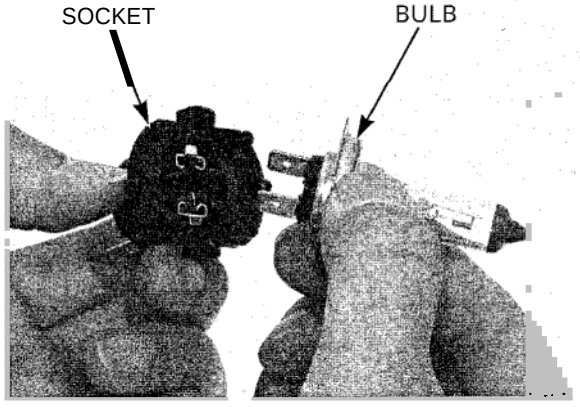
Unhook the bulb retainer and remove the headlight bulb/socket.

If you touch the bulb with your bare hands, clean it with cloth moistened with denatured alcohol to prevent early bulb failure.

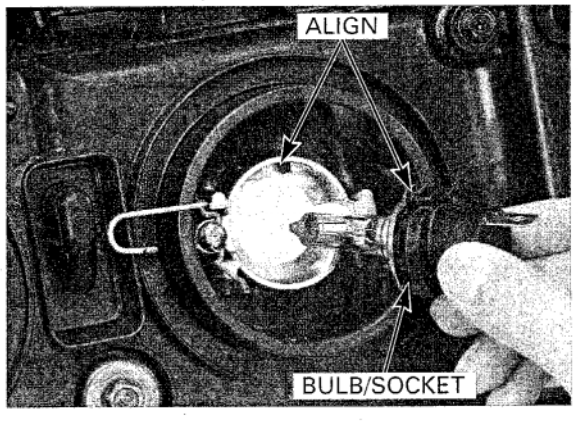


Remove the headlight bulb from the socket.

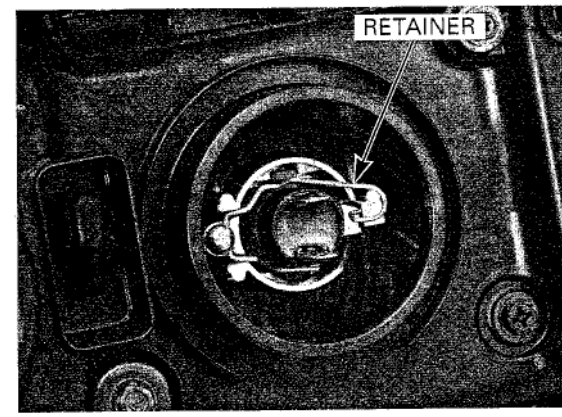
install a new bulb into the socket.



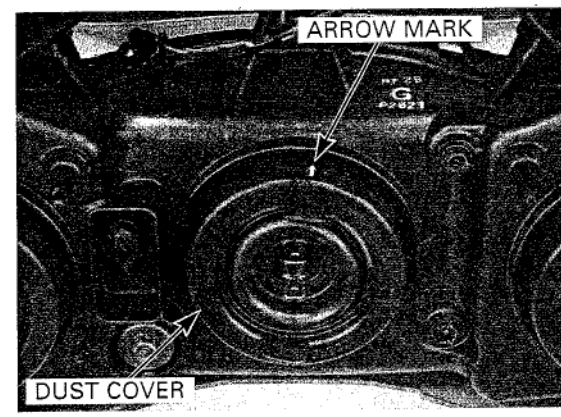
Install the new headlight bulb/socket aligning its tabs with the groove in the headlight unit.



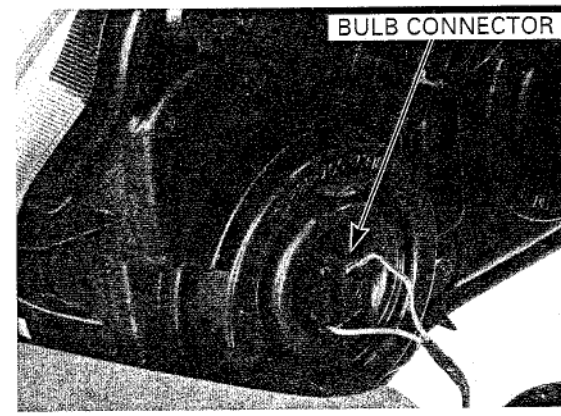
Hook the bulb retainer into the headlight unit groove.



Install the dust cover tightly against the headlight unit with its arrow mark facing up.



Connect the headlight connector.

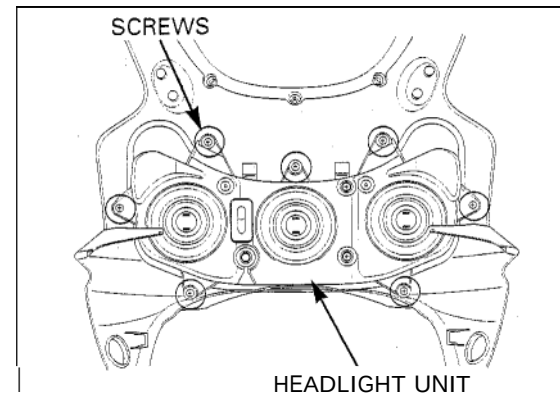


REMOVAL/INSTALLATION

Remove the upper cowl (page 2-5).

Remove the seven screws and headlight unit.

Install the headlight unit in the reverse order of removal.

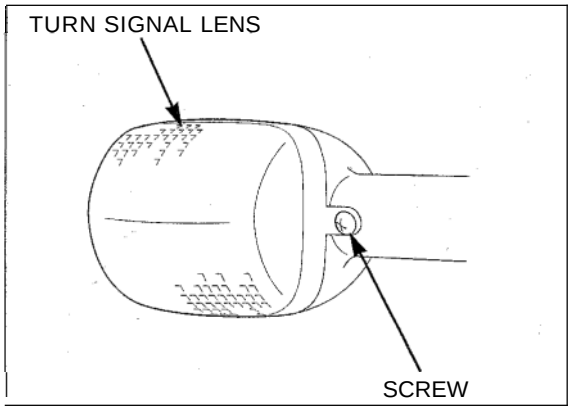


TURN SIGNAL

For turn signal light unit removal/installation, see page 2-5 and 2-9

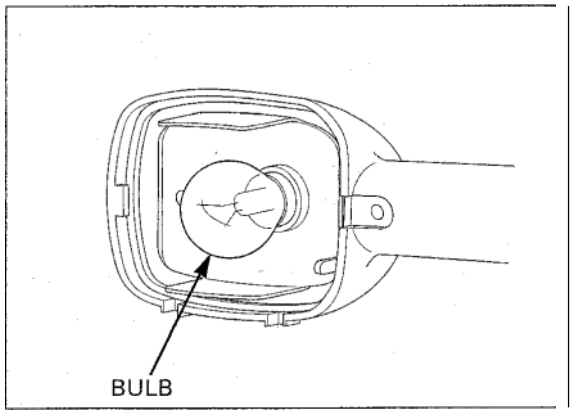
BULB REPLACEMENT

Remove the screw and turn signal lens.



While pushing in, turn the bulb counterclockwise to remove it and replace with a new one.

Install the turn signal lens in the reverse order of removal.

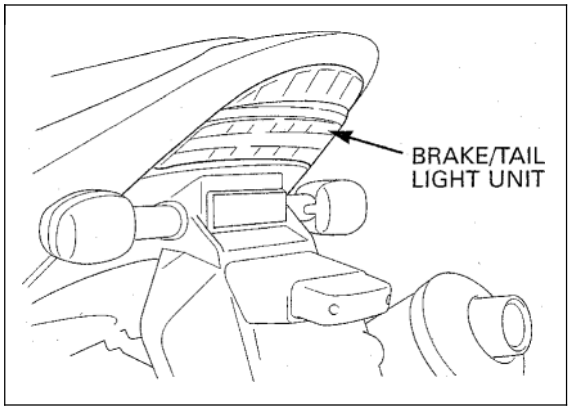


BRAKE/TAIL LIGHT

INSPECTION

Turn the ignition switch to "ON", and check the tail light operation.
Check that all LED in the brake/tail light unit light on with the front brake lever and/or rear brake pedal applied.

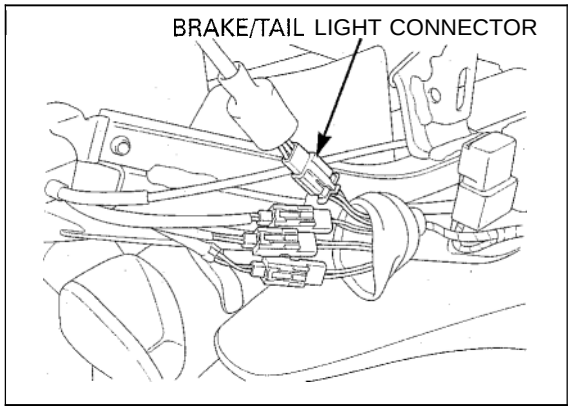
When even any one diode does not turn on, replace the brake/tail light assembly (refer to next procedure).



REMOVAL/INSTALLATION

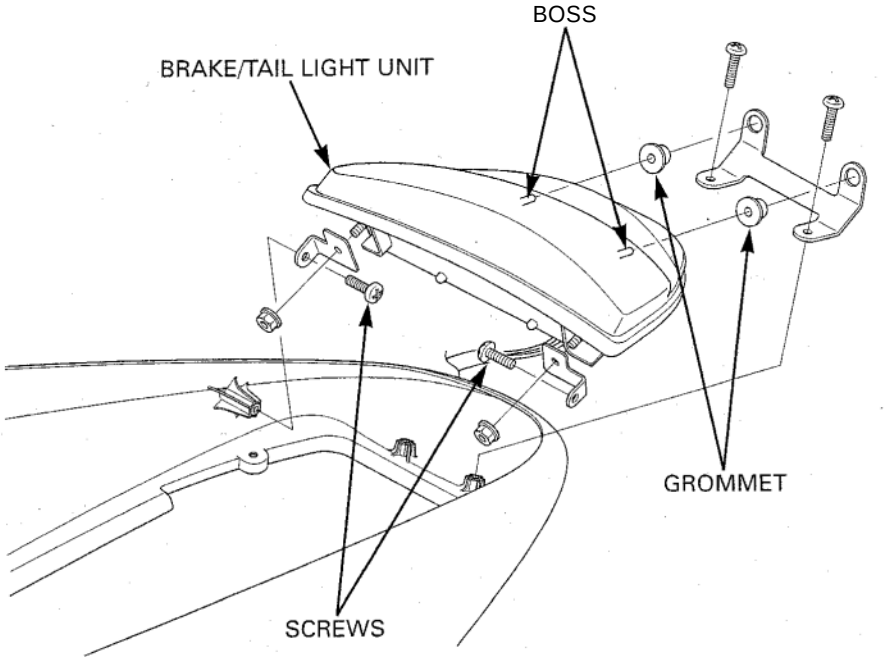
Remove the rear cowl (page 2-2).

Disconnect the brake/tail light **3P** connector.



Remove the brake/tail light unit mounting screws.
Pull out the bosses from the grommet, then remove the brake/tail light unit.

Installation is in the reverse order of removal.



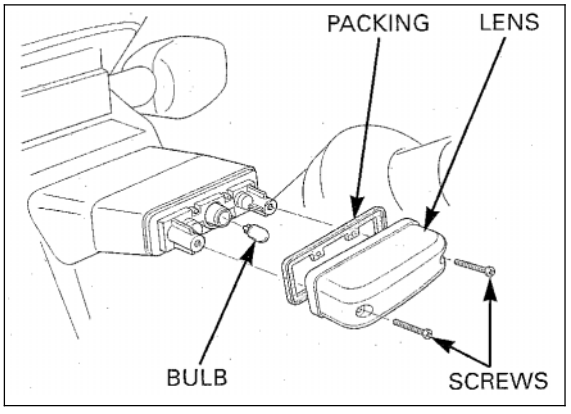
LICENSE LIGHT

BULB REPLACEMENT

Remove the screws, packing and lens.

Pull out the license light bulb and replace it with a new one.

Install the license light assembly in the reverse order of removal.

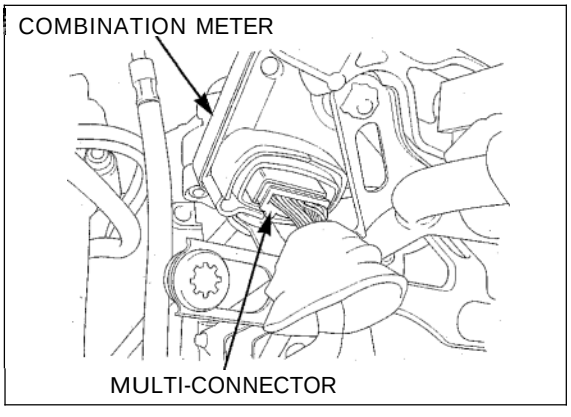


COMBINATION METER

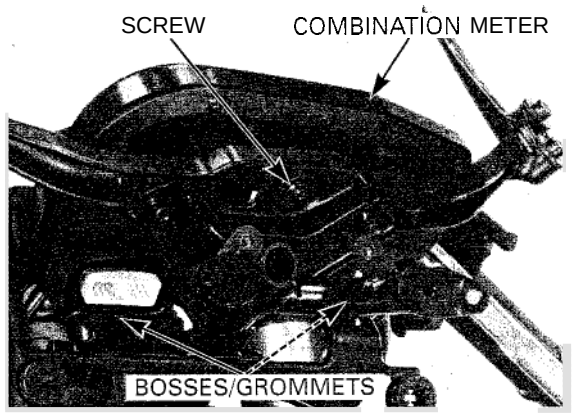
REMOVAL

Remove the upper cowl (page 2-5).
Remove the bank angle sensor (page 5-86).

Disconnect the combination meter multi-connector.

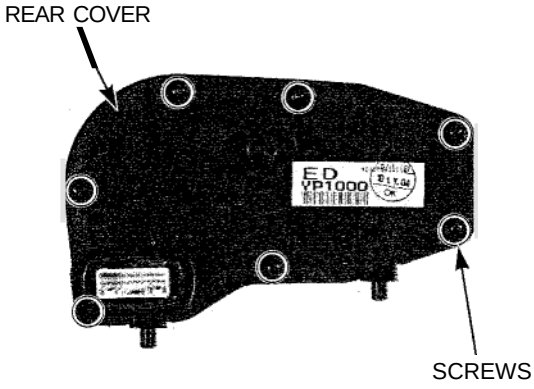


Remove the combination meter mounting screw. Release the combination meter case bosses from the bracket grommets, then remove the combination meter.

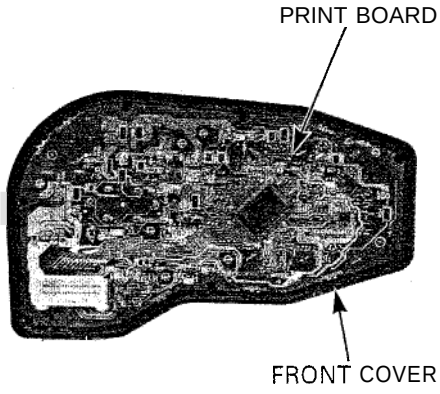


DISASSEMBLY

Remove the screws and combination meter rear cover.



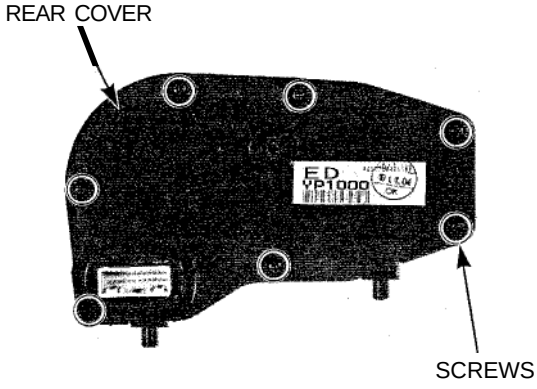
Remove the combination meter print board assembly from the front cover.



ASSEMBLY

Install the print board assembly into the front cover.

Install the rear cover and tighten the screws securely.

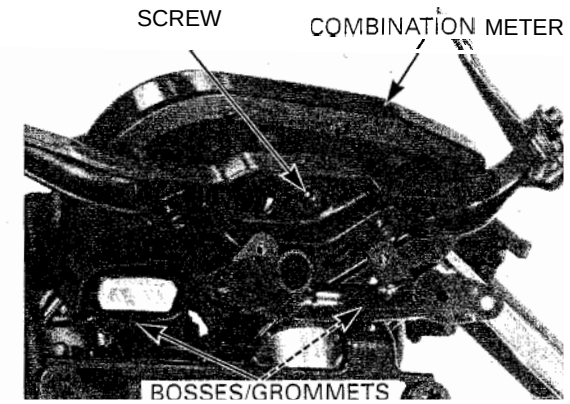


INSTALLATION

Align the combination meter case bosses with the grommets on the meter bracket.

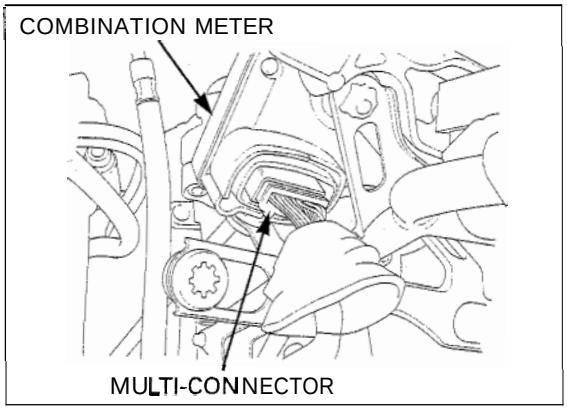
Install the combination meter onto the bracket.

Install and tighten the mounting screw.



Connect the combination meter multi-connector.

Install the bank angle sensor (page 5-86)
Install the upper cowl (page 2-6).

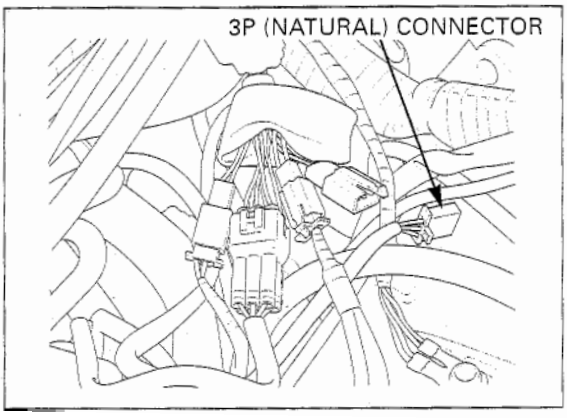


SPEEDOMETER/VEHICLE SPEED SENSOR

VOLTAGE INSPECTION

Open and support the front end of the fuel tank (page 3-4).

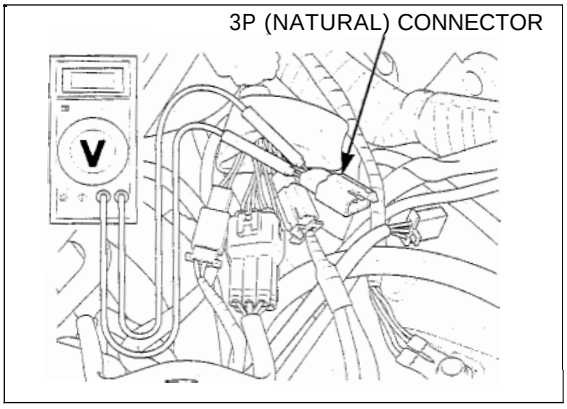
Disconnect the speed sensor 3P (Natural) connector and check for loose or poor contact of the connector.



With the ignition switch turned to "ON" and measure the voltage at the 3P (Natural) connector of the wire harness side.

Connection: Black/Brown (+) – Green/Black (–)
Standard: Battery voltage

If there is no voltage, repair or replace the wire harness.



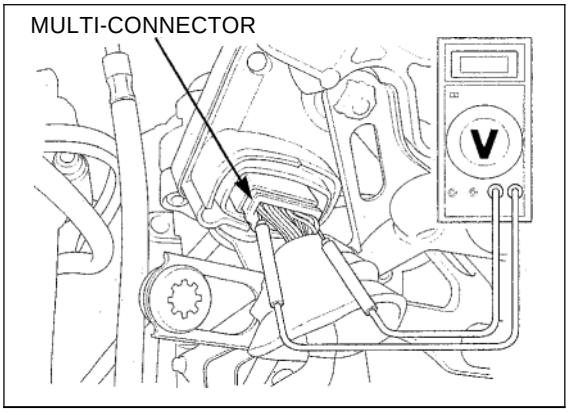
Remove the upper cowl (page 2-5).

Check for loose or poor connection of the combination meter multi-connector.

With the ignition switch turned to "ON" and measure the voltage at the multi-connector terminals.

Connection: Black/Brown (+) – Green/Black (–)
Standard: Battery voltage

If there is no voltage, repair or replace the wire harness.

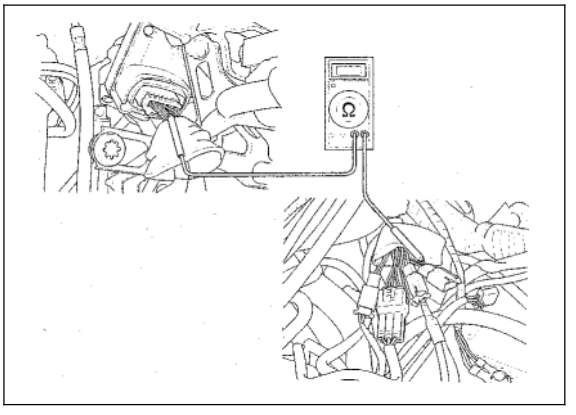


OUTPUT SIGNAL INSPECTION

With the ignition switch is OFF, check for continuity of the Pink/Green wire between the speed sensor connector and combination meter multi-connector.

There should be continuity

If there is no continuity, repair or replace the wire harness.

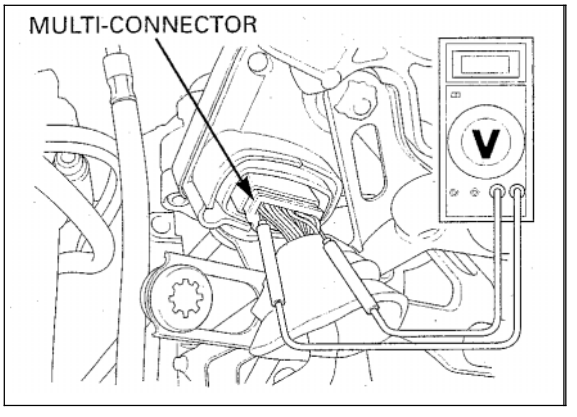


Support the motorcycle securely and place the rear wheel off the ground.
Shift the transmission into neutral.

Connect the speed sensor 3P (Natural) connector.
Measure the voltage at the combination meter terminals with the ignition switch is ON while slowly turning the rear wheel by hand.

CONNECTION: Pink/Green (+) – Green/Black (–)
STANDARD: Repeat 0 to 5V

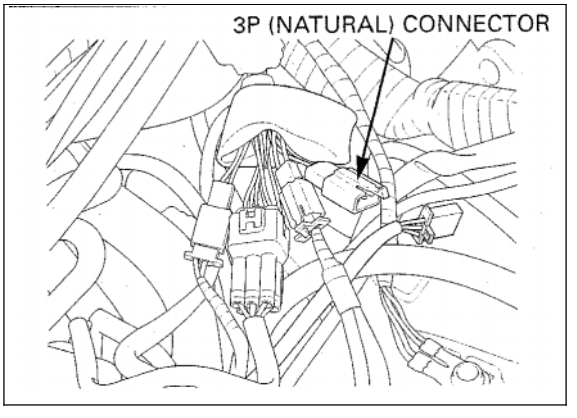
If the measurement is out of specification, inspect the open circuit in wire harness.



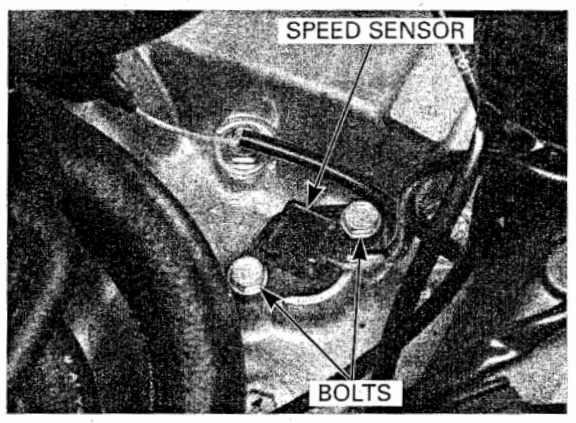
REMOVAL/INSTALLATION

Remove the fuel tank (page 5-59).

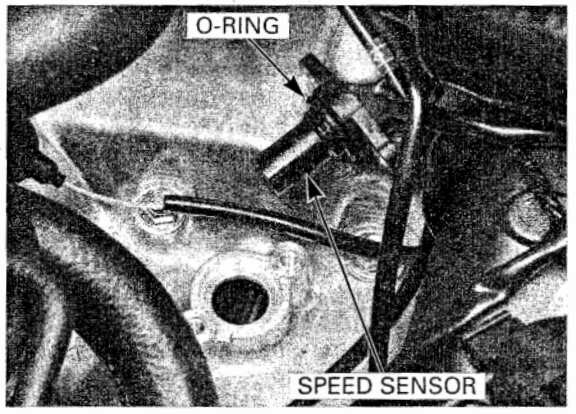
Disconnect the speed sensor 3P (Natural) connector.



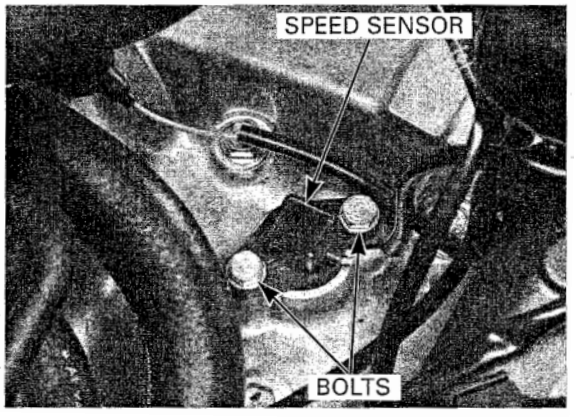
Remove the bolts and speed sensor.



Check the O-ring is in good condition, replace if necessary.
Install the speed sensor into the upper crankcase.

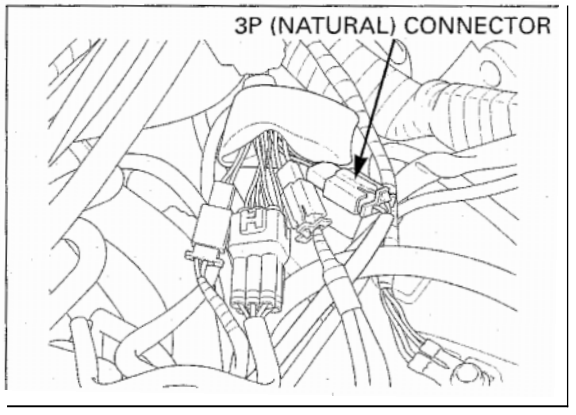


Install and tighten the mounting bolts securely.

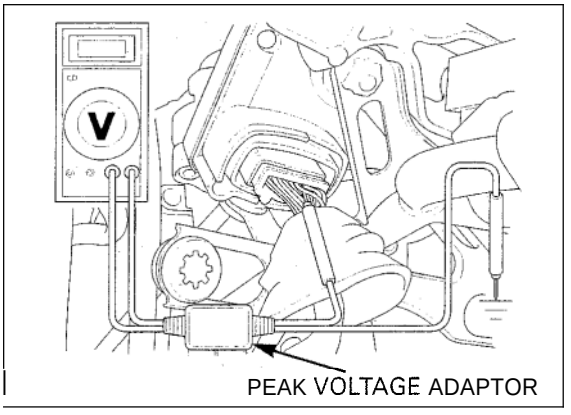


Route the sensor wire.

Connect the speed sensor **3P** (Natural) connector.



TACHOMETER



INSPECTION

Remove the upper cowl (page 2-5).

Check for loose or poor contact terminals of the combination meter multi-connector.

Connect the peak voltage adaptor to the tachometer Black/Yellow terminal and ground.

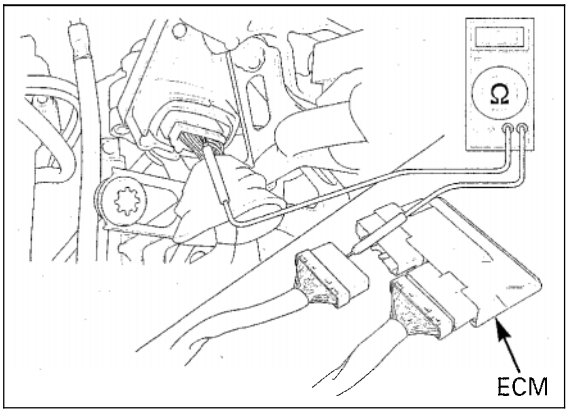
TOOLS:
IgnitionMate peak voltage tester (U.S.A. only) **or**
Peak voltage adaptor **07HGJ-0020100** (not available in U.S.A.)
with commercially available digital multimeter (impedance **10 MΩ/DCV** minimum)

CONNECTION: **Yellow/Green (+)** and Ground **(-)**

Start the engine and measure the tachometer input peak voltage.

PEAK VOLTAGE: **10.5** V minimum

If the value is normal, replace the tachometer.
If the measured value is below 10.5 V, replace the ECM.



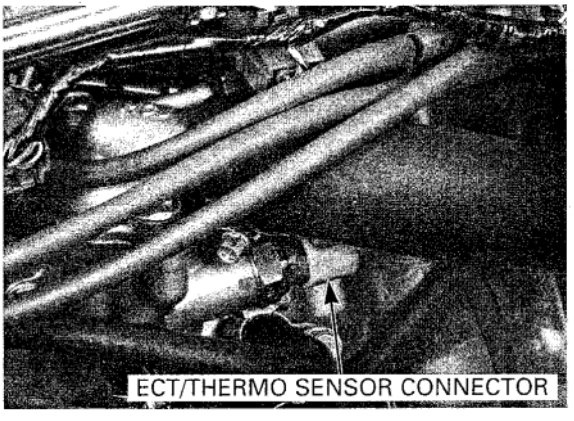
If the value is 0 V, perform the following:
Remove the ECM cover (page 5-87) and disconnect the ECM multi-connector.

Check for continuity between the tachometer terminal and the ECM (26P/Black) connector Yellow/Green terminals.
If there is no continuity, check the wire harness for an open circuit.

If there is continuity, replace the combination meter print board.

For tachometer replacement, see page 19-8; combination meter disassembly and assembly.

ECT/THERMO SENSOR



INSPECTION

Remove the fuel tank (page 5-59).
Drain the coolant (page 6-4).

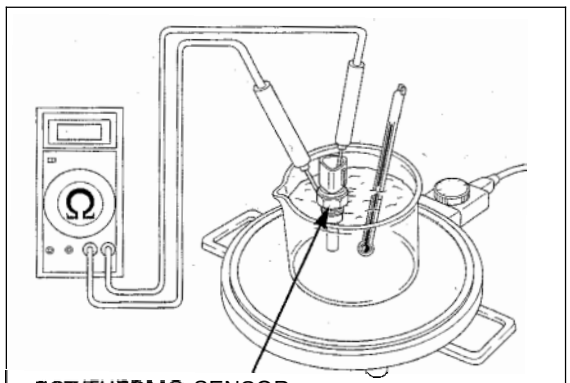
Disconnect the wire connector from the ECT/thermo sensor and remove the sensor.

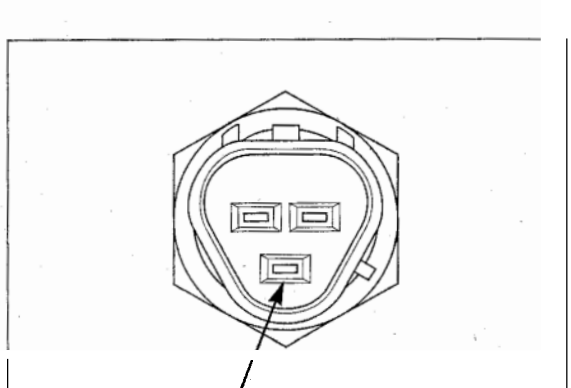
Suspend the ECT/thermo sensor in a pan of coolant (50 – 50 mixture) an electric heating element and measure the resistance through the sensor as the coolant heats up.

- Soak the ECT/thermo sensor in coolant up to its threads with at least 40 mm (1.6 in) from the bottom of the pan to the bottom of the sensor.
- Keep the temperature constant for 3 minutes before testing. A sudden change of temperature will result in incorrect readings. Do not let the thermometer or ECT/thermo sensor touch the pan.

Ternperature	80°C (68°F)	120°C (248°F)
Resistance	2.1 – 2.6 kΩ	0.65 – 0.73 kΩ

Replace the sensor if it is out of specification by more than 10% at any temperature listed.

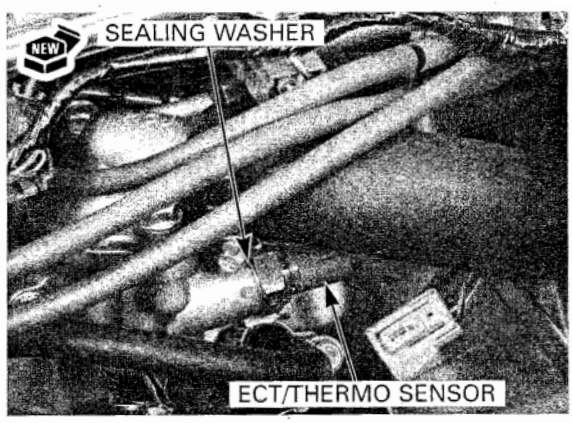




Always replace the sealing washer with a new one.

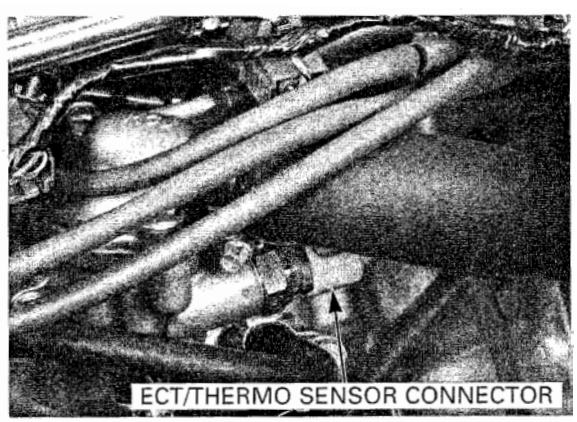
Install and tighten the ECT/thermo sensor to the specified torque.

TORQUE: 23 N·m (2.3 kgf·m, 17 lbf·ft)



Connect the ECT/thermo sensor connector.

Fill the system with recommended coolant and bleed the air (page 6-5).

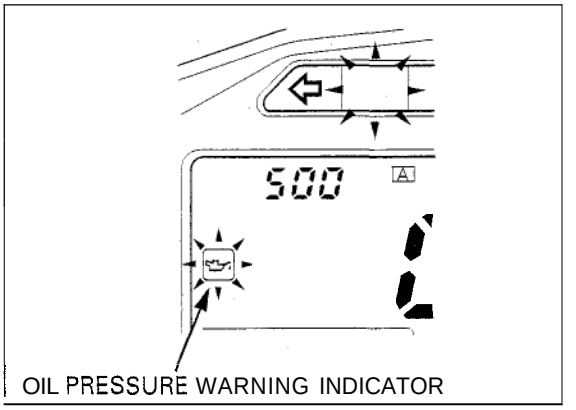


OIL PRESSURE SWITCH

INSPECTION

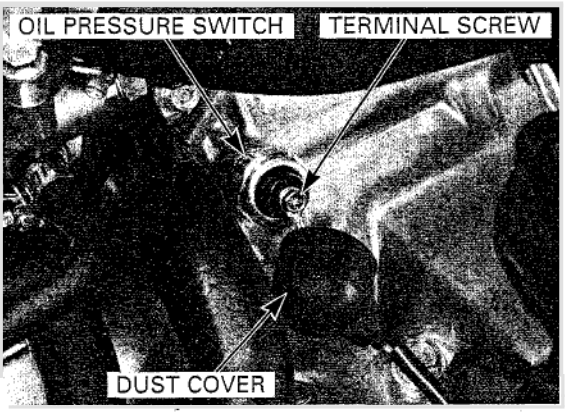
If the oil pressure warning indicator stays on while the engine is running, check the engine oil level before inspection.

Make sure that the oil pressure warning indicator comes on with the ignition switch turned to "ON".



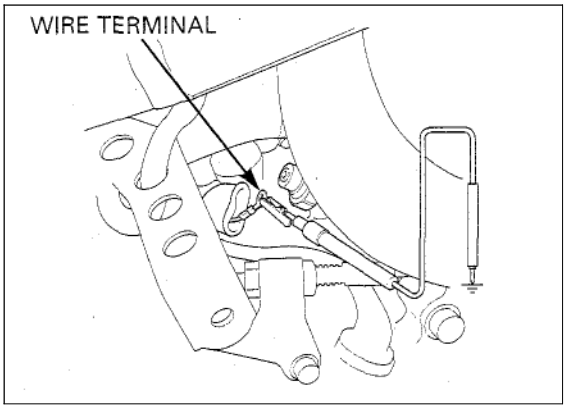
If the indicator does not come on, inspect as follows:
Remove the fuel tank (page 5-59).

Remove the dust cover.
Remove the screw and oil pressure switch terminal.



Short the oil pressure switch wire terminal with the ground using a jumper wire.
The oil pressure warning indicator comes on with the ignition switch turned to "ON".
If the indicator does not comes on, check the sub-fuse (10A) and wires for a loose connection or an open circuit.

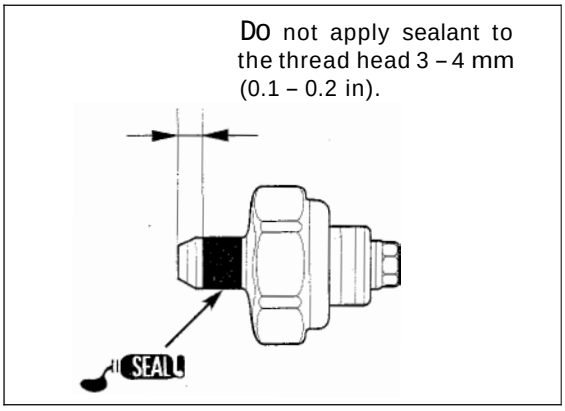
Start the engine and make sure the indicator goes out.
If the indicator does not go out, check the oil pressure (page 4-3).
If the oil pressure is normal, replace the oil pressure switch (see below).



REMOVAL/INSTALLATION

Remove the dust cover, terminal screw and wire terminal.
Remove the oil pressure switch from the crankcase.

Apply sealant to the oil pressure switch threads as shown.



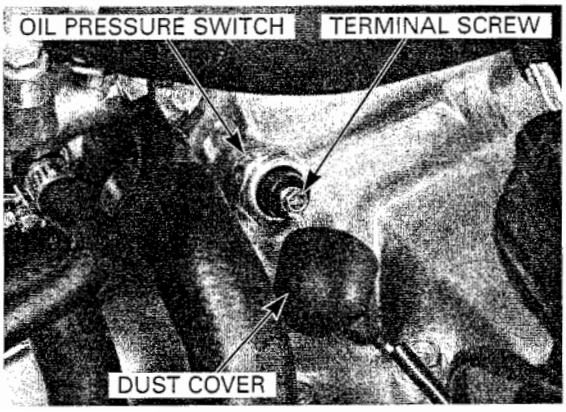
Install the oil pressure switch onto the crankcase, tighten it to the specified torque.

TORQUE: 12 N•m (1.2 kgf•m, 9 lbf•ft)

Connect the oil pressure switch terminal to the switch and tighten the screw to the specified torque.

TORQUE: 2 N•m (0.2 kgf•m, 1.4 lbf•ft)

Install the dust cover.



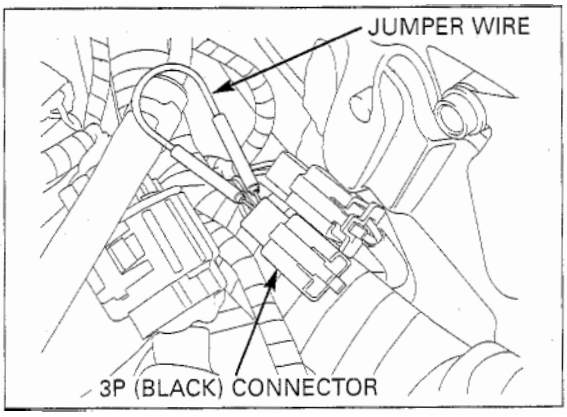
FUEL RESERVE SENSOR

INSPECTION

If the fuel reserve indicator does not indicate properly, check for the following.

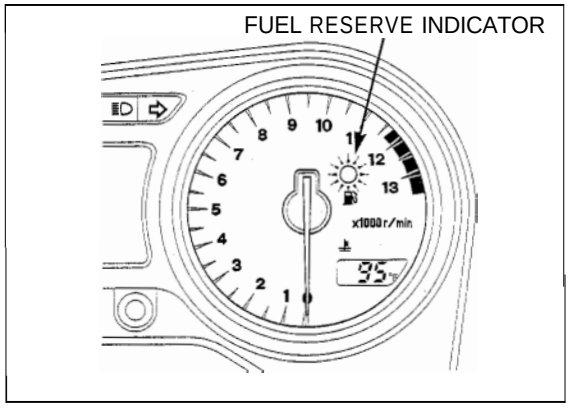
Open and support the front end of the fuel tank (page 3-4).

Disconnect the fuel reserve sensor 3P (Black) connector.
Short the wire harness side connector Brown/Black and Green/Black terminals with a jumper wire.



Turn the ignition switch to "ON" and make sure the fuel reserve indicator comes on.

If the indicator comes on, replace the fuel pump assembly.
If the indicator still does not come on, check for an open or short circuit in the wire harness.

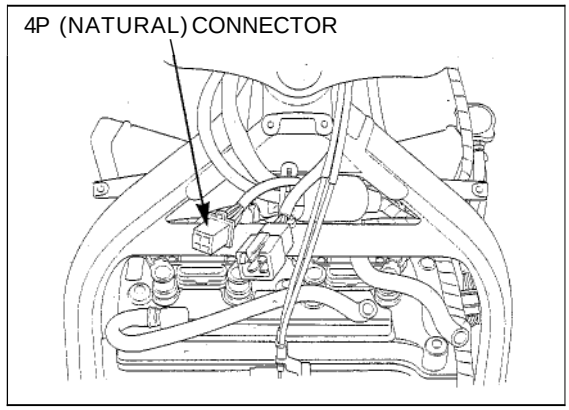


IGNITION SWITCH

INSPECTION

Remove the air cleaner housing (page 5-64).

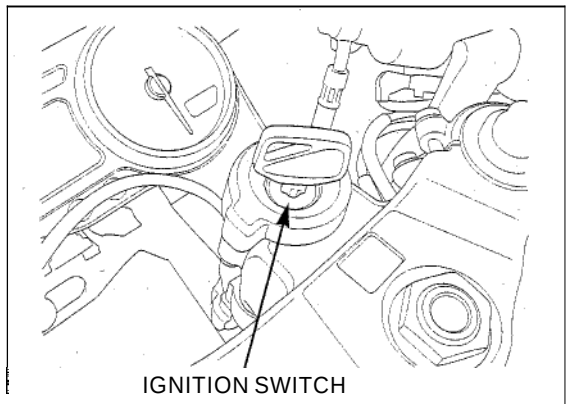
Disconnect the ignition switch wire 4P (Natural) connector.



Check for continuity between the wire terminals of the ignition switch 4P (Natural) connector in each switch position.
Continuity should exist between the color coded wires as follows:

IGNITION SWITCH

	FAN	IG	BAT1	KEY
ON	○	○	○	KEY ON
OFF				KEY OFF
LOCK				KEY OFF LOCK PIN
LEADCOLOR	P	R/BI	R	—

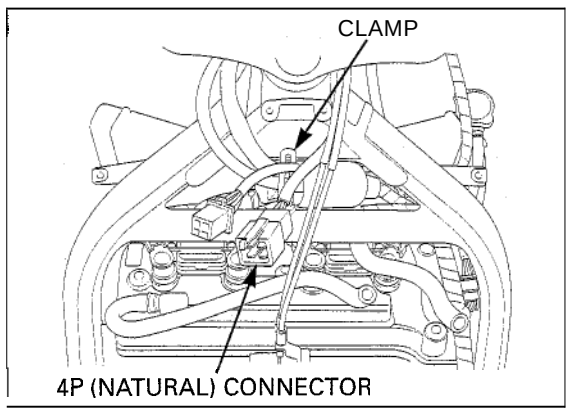


REMOVAL/INSTALLATION

Remove the air cleaner housing (page 5-64).

Release the connector boot from the wire clamp.
Disconnect the ignition switch wire 4P (Natural) connector.

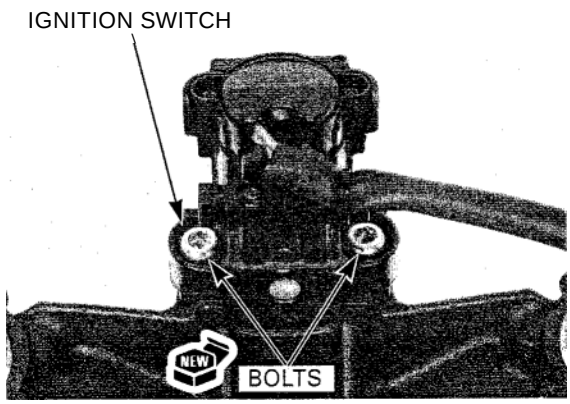
Remove the top bridge (page 13-5).



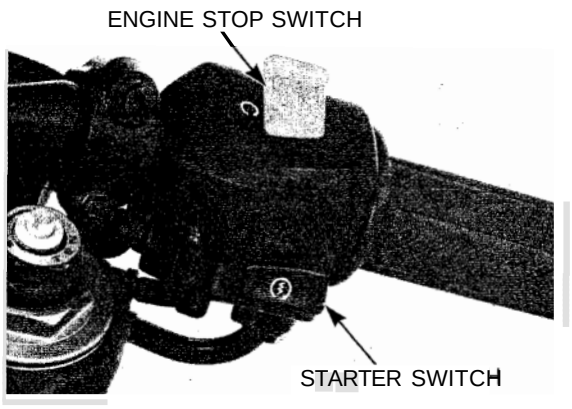
Remove the bolts and ignition switch.

Install the ignition switch to the top bridge.
Install the new main switch mounting bolts and tighten the bolts to the specified torque.

TORQUE: 26 N•m (2.7 kgf•m, 20 lbf•ft)



HANDLEBAR SWITCHES



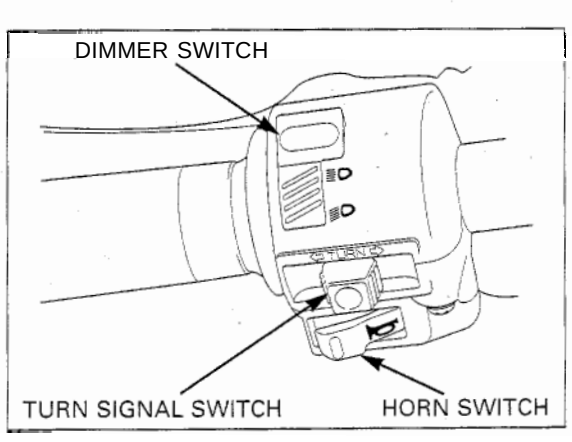
Remove the air cleaner housing (page 5-64).

Disconnect the handlebar switch connectors.

Check for continuity between the wire terminals of the handlebar switch connector.
Continuity should exist between the color coded wire terminals as follows:

OFF		
	—	

	ST	IG	BAT3	HL
FREE			○	○
PUSH	○	○		
LEAD COLOR	Y/R	Bl	Bl/Br	W



	HL	Lo	Hi
Lo			
(N)			
Hi	O		O
LEADCOLOR	W		Bu

HORN SWITCH

	Ho	BAT5
FREE		
PUSH	○	○
LEAD COLOR	Lg	Bl/Br

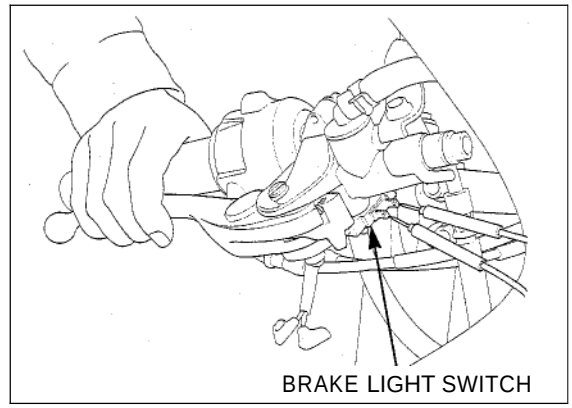
	W	R	L	BAT5	PR	PL
R	○	○		○		
N				○	○	○
L	○		○	○	○	
LEADCOLOR	Gr	Lb	O	Bl/Br	Lb/W	O/W

BRAKE LIGHT SWITCH

FRONT

Disconnect the front brake light switch connectors and check for continuity between the terminals.

There should be continuity with the brake lever applied, and there should be no continuity with the brake lever released.

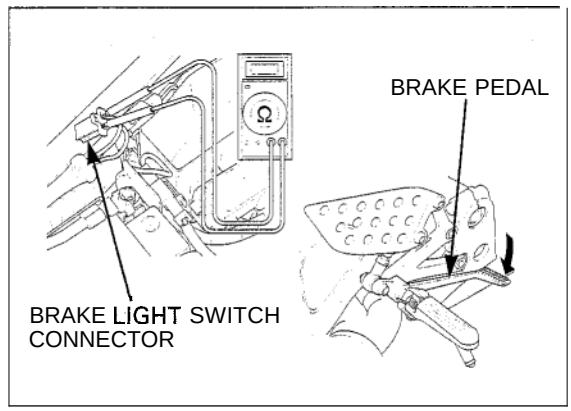


REAR

Remove the seat (page 2-2).

Disconnect the rear brake light switch connector and check for continuity between the terminals.

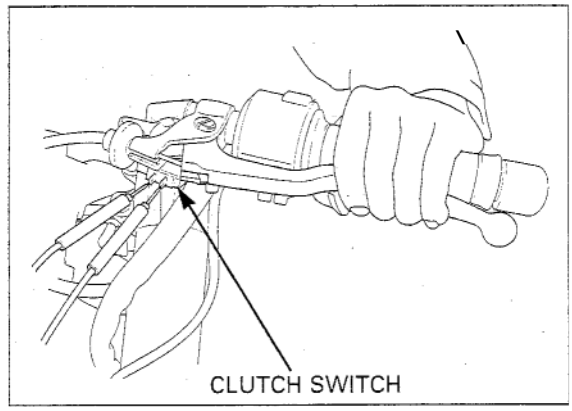
There should be continuity with the brake pedal applied, and there should be no continuity with the brake pedal is released.



CLUTCH SWITCH

Disconnect the clutch switch connectors.

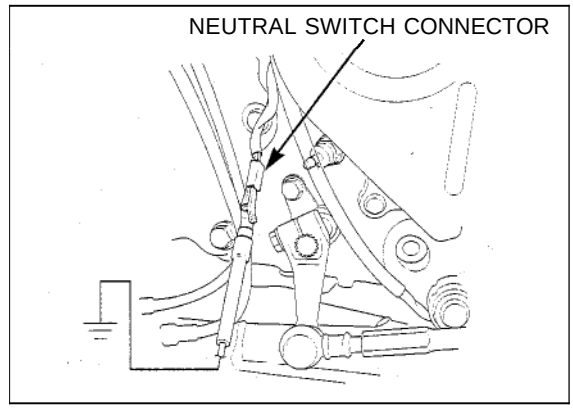
There should be continuity with the clutch lever applied, and there should be no continuity with the clutch lever is released.



NEUTRAL SWITCH

Remove the lower cowl (page 2-7).

Disconnect the neutral switch connector from the switch.
Shift the transmission into neutral and check for continuity between the Light green wire terminal and ground.
There should be continuity with the transmission is in neutral, and no continuity when the transmission is into gear.

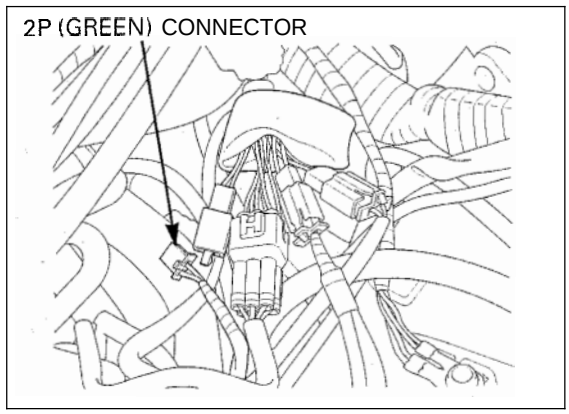


SIDE STAND SWITCH

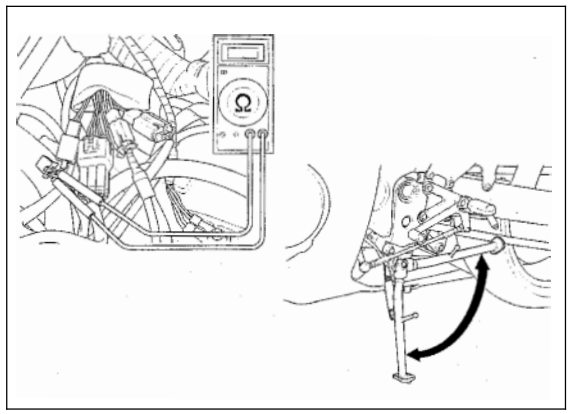
INSPECTION

Open and support the front end of the fuel tank (page 3-4).

Disconnect the side stand switch 2P (Green) connector.

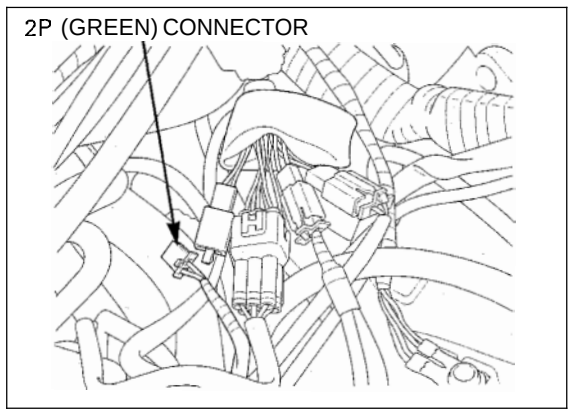


Check for continuity between the wire terminals of the side stand switch 2P (Green) connector.
Continuity should exist only when the side stand is up.

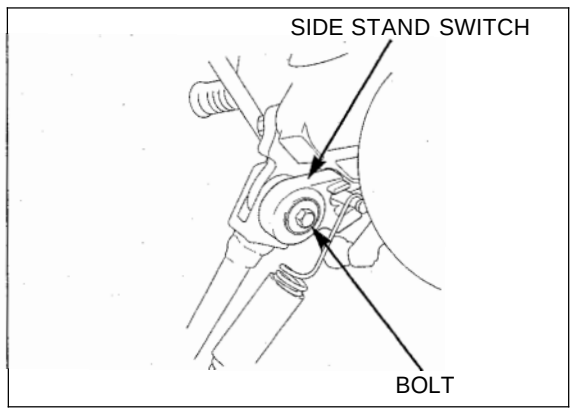


REMOVAL

Disconnect the side stand switch 2P (Green) connector.

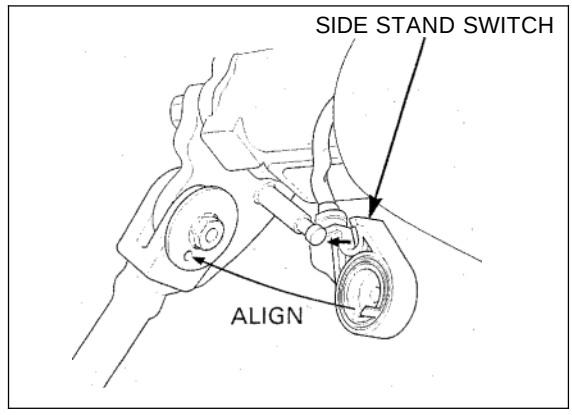


Remove the bolt and side stand switch.



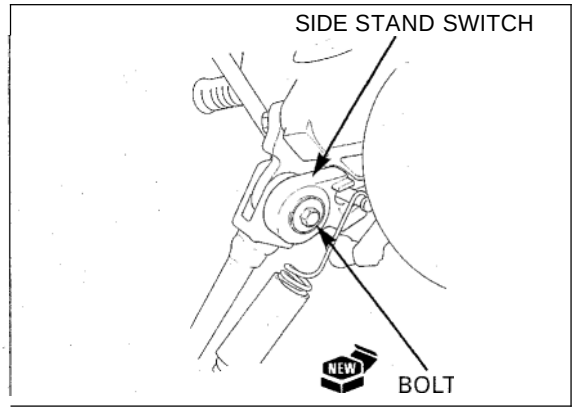
INSTALLATION

Install the side stand switch by aligning the switch pin with the side stand hole and the switch groove with the return spring holding pin.

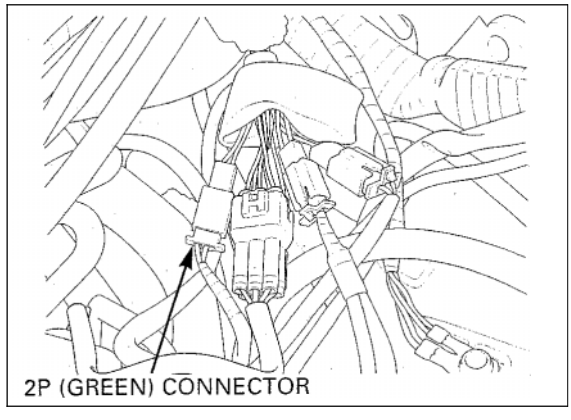


Secure the side stand switch with a new bolt.

TORQUE: 10 N•m (1.0 kgf•m, 7 lbf•ft)



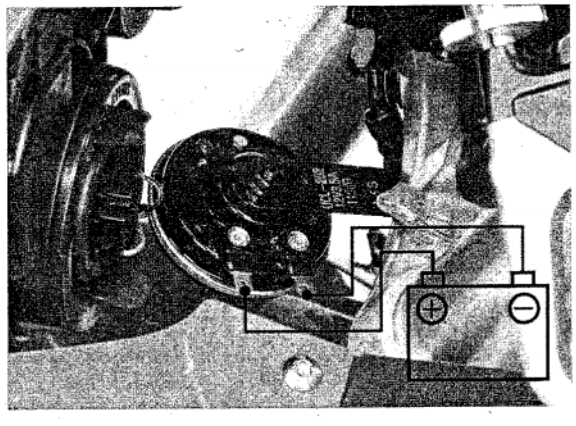
Connect the side stand switch 2P (Green) connector.



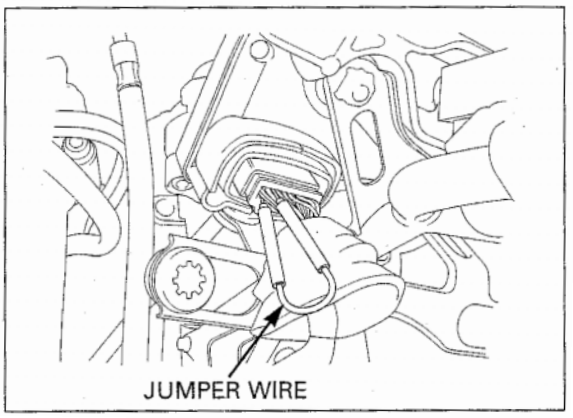
HORN

Disconnect the wire connectors from the horn.

Connect the 12V battery to the horn terminal directly. The horn is normal if it sounds when the 12V battery is connected across the horn terminals.



TURN SIGNAL RELAY



INSPECTION

Remove the upper cowl (page 2-5).

Check the following:
- Battery condition
- Burned bulbs or non-specified wattage
- Burnedfuse
- Ignition switch and turn signal switch function
- Loose connectors

If the above items are all normal, check the following:
Disconnect the combination meter multi-connector from the combination meter.

Short the White/Green and Gray terminals of the combination meter connector with a jumper wire.
Start the engine and check the turn signal light by turning the switch on.

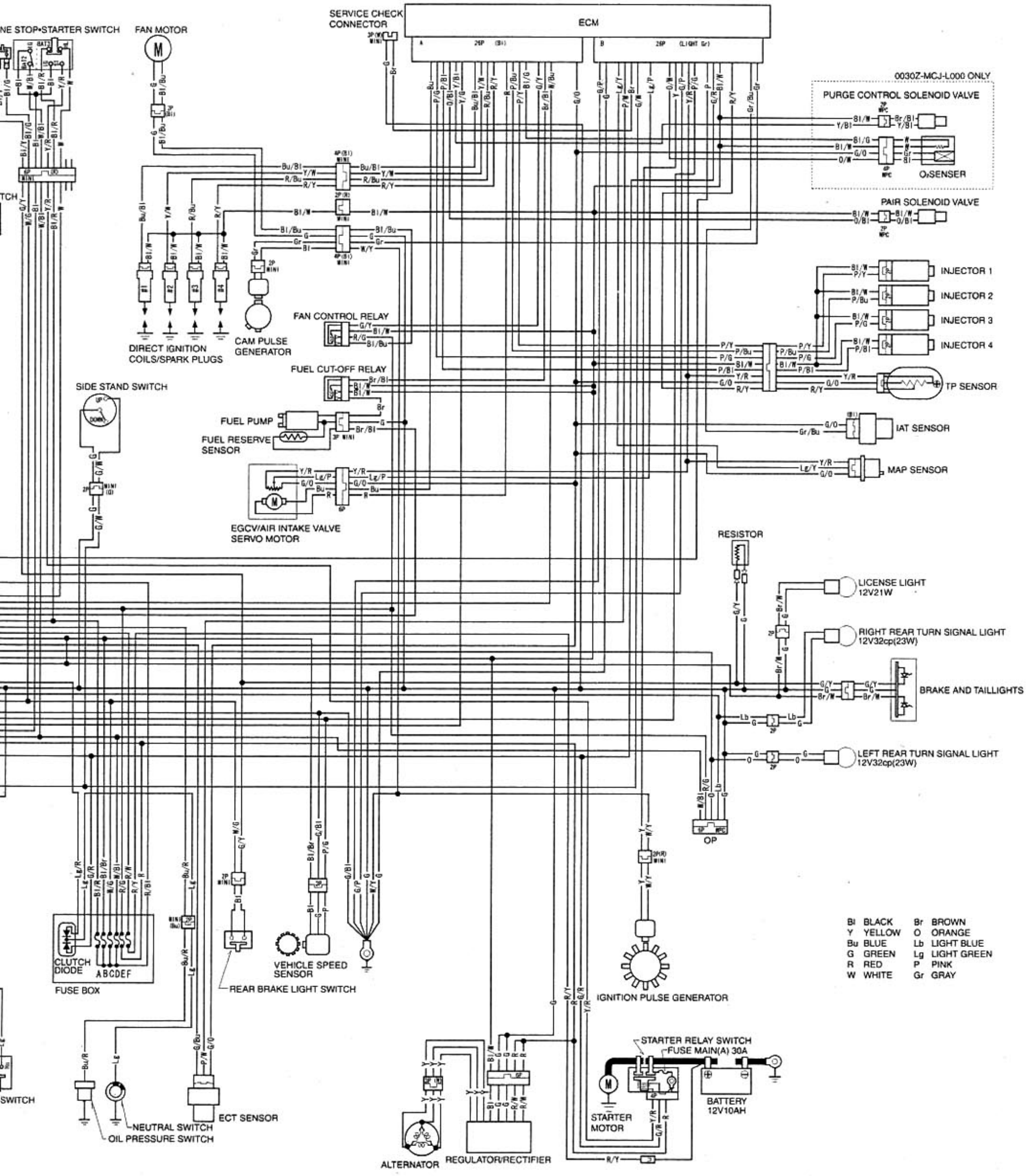
Light comes on

- Faulty turn signal relay (combination meter).
- Poor connection of the connector.

Light does not come on

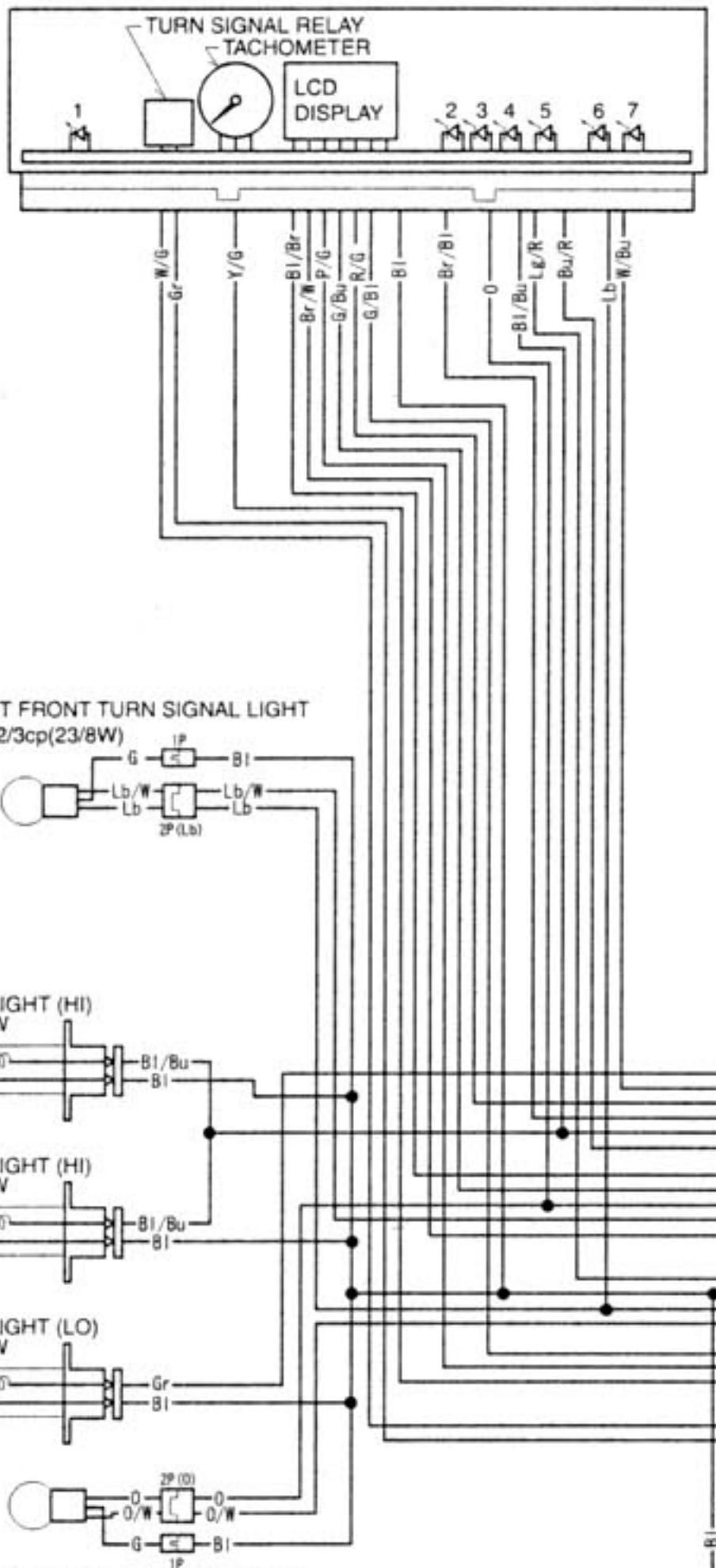
- Broken wire harness

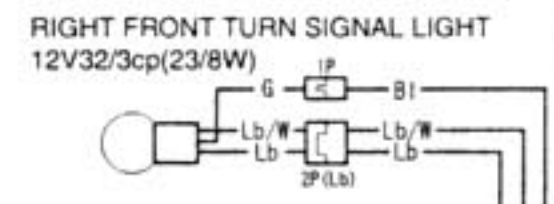
20. WIRING DIAGRAM

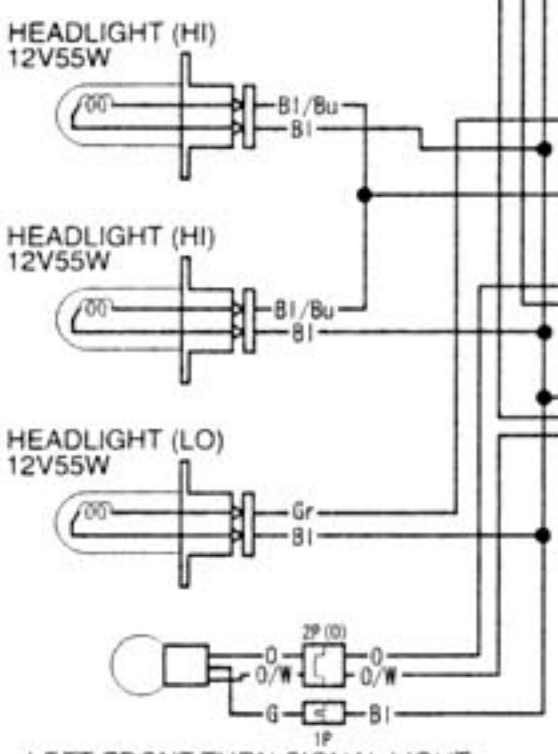


0030Z-MCJ-A000
0030Z-MCJ-L000

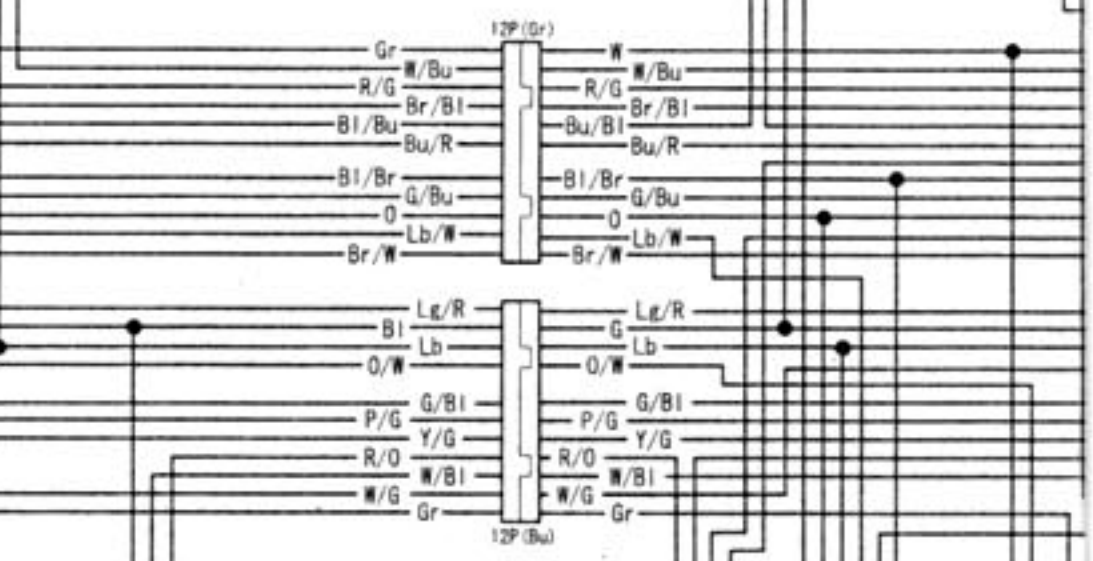
1 ILLUMINATION
2 FUEL RESERVE INDICATOR
3 LEFT TURN SIGNAL INDICATOR
4 HIGH BEAM INDICATOR
5 NEUTRAL INDICATOR
6 RIGHT TURN SIGNAL INDICATOR
7 MALFUNCTION INDICATOR

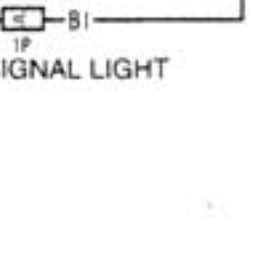






LEFT FRONT TURN SIGNAL LIGHT
12V32/3cp(23/8W)



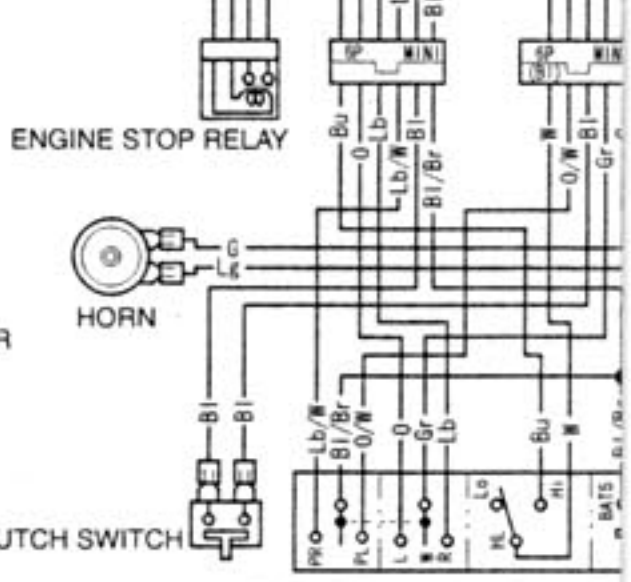


BANK ANGLE SENSOR

FRONT BRAKE LIGHT SWITCH

HEADLIGHT RELAY

IGNITION SW



FUSE BOX

A 20A HEADLIGHTS
B 10A NEUTRAL · OIL · TEMPMETER · TACHOMETER · SPEEDDOMETER · POSITION · HORN · METER LIGHT · TAILLIGHT
C 10A TURN SIGNAL · FRONT,REAR BRAKELIGHT
D 10A IGNITION•STARTER
E 20A CLOCK · FAN MOTOR
F 20A F I

SWITCH CONTINUITY

TURN SIGNAL SWITCH

	W	R	L	BAT5	PR	PL
R	○	○			○	○	
N					○	○	○
L	○	—	○		○	○	

DIMMER SWITCH

	HL	Lo	Hi
Lo			
(N)			
Hi	○	—	○

HORN SWITCH

	Ho	BAT5
FREE		
PUSH	○	○

ENGINE STOP SWITCH

	IG	BAT2
OFF		
RUN	○	○

STARTER SWITCH

	ST	IG	BAT3	HL
FREE			○	○
PUSH	○	○		

IGNITION SWITCH

	FAN	IG	BAT1	KEY
ON	○	○	○	KEY ON
OFF				KEY OFF
LOCK				KEY OFF LOCK PIN

21. TROUBLESHOOTING

ENGINE DOES NOT START OR IS HARD TO START	21-1	POOR PERFORMANCE AT HIGH SPEED	21-4
ENGINE LACKS POWER	21-2	POOR HANDLING	21-4
POOR PERFORMANCE AT LOW AND IDLE SPEED	21-3		

ENGINE DOES NOT START OR IS HARD TO START

		Possible cause
1. Check for operation of the fuel pump	Abnormal	• Faulty fuel pump (Section 5)
Normal		
2. Inspect the fuel flow	Abnormal	• Faulty pressure regulator (Section 5)
Normal		
3. Inspect the fuel injector	Abnormal	• See section 5
Normal		
4. Perform a spark test	Weak or no spark	• Faulty spark plug • Fouled spark plug • Faulty ECM • Broken or shorted spark plug wire • Faulty ignition switch • Faulty ignition pulse generator • Faulty engine stop switch • Loose or disconnected ignition system wires
Good spark		
5. Test cylinder compression	Low compression	• Valve stuck open • Worn cylinder and piston ring • Damaged cylinder head gasket • Seized valve • Improper valve timing
Compression normal		
6. Starting following normal procedure	Engine starts but stops	• Improper starter valve operation • Intake pipe leaking • Improper ignition timing (Faulty ignition coil or ignition pulse generator) • Fuel contaminated
Engine does not start		
7. Remove and inspect spark plug	Wet plug	• Starter valve closed • Throttle valve open • Clogged air cleaner

ENGINE LACKS POWER

			Possible cause
1.	Raise wheel off the ground and spin by hand Wheel spins freely	Wheels do not spin freely	• Brake dragging • Worn or damaged wheel bearing
2.	Check tire pressure Pressure normal	Pressure low	• Faulty tire valve • Punctured tire
3.	Accelerate rapidly from low to second Engine speed reduced when clutch is released	Engine speed does not change accordingly when clutch is released	• Clutch slipping • Worn clutch discs/plates • Warped clutch discs/plates • Weak clutch spring • Additive in engine oil
4.	Accelerate lightly Engine speed increase	Engine speed does not increase	• Air cleaner dirty • Restricted fuel flow • Clogged muffler • Pinched fuel tank breather
5.	Check ignition timing Correct	Incorrect	• Faulty ECM • Faulty ignition pulse generator
6.	Test cylinder compression Normal	Incorrect	• Valve stuck open • Worn cylinder and piston rings • Leaking head gasket • Improper valve timing
7.	Inspect fuel flow Normal	Abnormal	• Faulty pressure regulator (Section 5)
8.	Inspect the fuel injector Normal	Abnormal	• See section 5
9.	Remove spark plugs Not fouled or discolored	Fouled or discolored	• Faulty spark plug
10.	Check oil level and condition Correct	Incorrect	• Oil level too high • Oil level too low • Contaminated oil
11.	Remove cylinder head cover and inspect lubrication Valve train lubricated properly	Valve train not lubricated properly	• Clogged oil passage • Clogged oil control orifice

Possible **cause**

12. Check for engine overheating — Overheating →
- Coolant level low
  Fan motor not working (faulty fan motor switch)
  Thermostat stuck close
- Excessive carbon build-up in combustion chamber
  Use of poor quality fuel
  Wrong type of fuel
  Clutch slipping

Not overheating

13. Accelerate or run at high speed — Engine knocks →
- Worn piston and cylinder
  Wrong type of fuel
  Excessive carbon build-up in combustion chamber
  Ignition timing to advanced (faulty ECM)
- Lean fuel mixture

Engine does not knock

POOR PERFORMANCE AT LOW AND IDLE SPEED

Possible cause

1. Check ignition timing — Incorrect →
- Improper ignition timing

Correct

2. Check the starter valve synchronization — Incorrect →
- See section 5

Correct

3. Inspect the fuel flow — Abnormal →
- Faulty pressure regulator (Section 5)

Normal

4. Inspect the fuel injector — Abnormal →
- See section 5

Normal

5. Check for leaks in the intake pipe — Leaking →
- Loose insulator clamp
  Damaged insulator

Not leak

6. Perform spark test — Weak or intermittent spark →
- Faulty spark plug
  Faulty carbon or wet fouled spark plug
- Faulty ECM
- Faulty ignition coil
- Broken or shorted spark plug wire
- Faulty engine stop switch
- Faulty ignition pulse generator
- Faulty ignition switch
- Loose or disconnected ignition system wires

Good spark

POOR PERFORMANCE AT HIGH SPEED

		Possible cause
1. Check ignition timing	Incorrect	• Faulty ECM
Correct		
2. Inspect the fuel flow	Abnormal	• Faulty pressure regulator (Section 5)
Normal		
3. Inspect the fuel injector	Abnormal	• See section 5
Normal		
4. Check valve timing	Incorrect	• Camshaft not installed properly
Correct		
5. Check valve spring	Weak	• Faulty valve spring
Not weak		

POOR HANDLING

	Possible cause
1. If steering is heavy	• Steering stem adjusting nut too tight • Damaged steering head bearings
2. If either wheel is wobbling	• Excessive wheel bearing play • Bent rim • Improper installed wheel hub • Swingarm pivot bearing excessively worn • Bent frame
3. If the motorcycle pulled to one side	• Faulty shock absorber • Front and rear wheel not aligned • Bent fork • Bent swingarm • Bent axle

22. INDEX

AIR CLEANER 3-6
AIR CLEANER HOUSING 5-64
ALTERNATOR CHARGING COIL 16-7
ALTERNATOR COVER INSTALLATION 10-8
ALTERNATOR COVER REMOVAL 10-2
BANK ANGLE SENSOR 5-85
BATTERY 16-4
BODY PANEL LOCATIONS 2-0
BRAKE FLUID 3-24
BRAKE FLUID REPLACEMENT/AIR BLEEDING 15-4
BRAKE LIGHT SWITCH 3-26
BRAKE LIGHT SWITCH 19-18
BRAKE PAD WEAR 3-25
BRAKE PAD/DISC 15-8
BRAKE PEDAL 15-28
BRAKE SYSTEM 3-25
BRAKE/TAIL LIGHT 19-6
CABLE & HARNESS ROUTING 1-23
CAMSHAFT INSTALLATION 8-24
CAMSHAFT REMOVAL 8-7
CAM PULSE GENERATOR 5-83
CAM CHAIN TENSIONER LIFTER 8-32
CHARGING SYSTEM INSPECTION 16-6
CLUTCH 9-4
CLUTCH SYSTEM 3-27
CLUTCH SWITCH 19-19
COOLANT REPLACEMENT 6-4
COOLING SYSTEM 3-18
COMBINATION METER 19-8
CRANKCASE COMBINATION 11-12
CRANKCASE SEPARATION 11-3
CRANKSHAFT 12-3
CYLINDER COMPRESSION TEST 8-4
CYLINDER HEAD ASSEMBLY 8-20
CYLINDER HEAD COVER ASSEMBLY 8-29
CYLINDER HEAD COVER DISASSEMBLY 8-6
CYLINDER HEAD COVER INSTALLATION 8-30
CYLINDER HEAD COVER REMOVAL 8-5
CYLINDER HEAD DISASSEMBLY 8-13
CYLINDER HEAD INSPECTION 8-14
CYLINDER HEAD INSTALLATION 8-22
CYLINDER HEAD REMOVAL 8-12
DIODE 18-11
DRIVE CHAIN 3-20
DUCT COVER 2-4
ECT SENSOR 5-82
ECT/THERMO SENSOR 13-12
ECM (ENGINE CONTROL MODULE) 5-87
EGCV 5-97
EGCV AND AIR INTAKE VALVE INSPECTION 5-92
EGCV AND AIR INTAKE VALVE SERVO MOTOR 5-95
EMISSION CONTROL INFORMATION LABELS 1-40
EMISSION CONTROL SYSTEMS 1-37
ENGINE IDLE SPEED 3-17
ENGINE INSTALLATION 7-7
ENGINE OIL/OIL FILTER 3-15
ENGINE REMOVAL 7-3
ENGINE STOP RELAY 5-86
EVAP PURGE CONTROL SOLENOID VALVE (California type only) 5-89
EVAPORATIVE EMISSION CONTROL SYSTEM (California type only) 3-19
FAN CONTROL RELAY 6-17
FAST IDLE WAX UNIT 5-75
FLYWHEEL INSTALLATION 10-7
FLYWHEEL REMOVAL 10-3
FORK 13-15
FRONT BRAKE CALIPER 15-21
FRONT FENDER 2-8
FRONT MASTER CYLINDER 15-12
FRONT WHEEL 13-9
FUEL CUT-OFF RELAY 5-58
FUEL LINE 3-4
FUEL LINE INSPECTION 5-54
FUEL PUMP 5-57
FUEL RESERVE SENSOR 19-15
FUEL TANK 5-59
GEARSHIFT LINKAGE 9-12
HANDLEBAR SWITCHES 19-17
HANDLEBARS 13-4
HEADLIGHT 19-4
HEADLIGHT AIM 3-27
HORN 19-20
IAT SENSOR 5-82
IGNITION PULSE GENERATOR 17-6
IGNITION SYSTEM INSPECTION 17-4
IGNITION SWITCH 19-16
IGNITION TIMING 17-8
INJECTORS 5-72
INNER MIDDLE COWL 2-7
LICENSE LIGHT 19-7
LOWER BRACKET INSTALLATION 7-12
LOWER BRACKET REMOVAL 7-2
LOWER COWL 2-7
LUBRICATION SYSTEM DIAGRAM 4-0
LUBRICATION & SEAL POINTS 1-19
MAINTENANCE SCHEDULE 3-3
MAP SENSOR 5-81
MODEL IDENTIFICATION 1-1
MUFFLER/EXHAUST PIPE 2-13
NEUTRAL SWITCH 19-18
NUTS, BOLTS, FASTENERS 3-31
O_2 SENSOR (California type only) 5-90
OIL COOLER 4-9
OIL PRESSURE SWITCH 19-14
OIL PRESSURE INSPECTION 4-3
OIL PUMP 4-5
OIL STRAINER/PRESSURE RELIEF VALVE 4-3
PAIR SOLENOID VALVE 5-88
PGM-FI (PROGRAMMED FUEL INJECTION) SYSTEM 5-6
PGM-FI SELF-DIAGNOSIS MALFUNCTION INDICATOR LAMP (MIL) FAILURE CODES 5-10
PILLION SEAT/REAR COWL 2-2
PISTON/CONNECTING ROD 11-4
PRESSURE REGULATOR 5-74
RADIATOR 6-8
RADIATOR COOLANT 3-18
RADIATOR RESERVE TANK 6-16
REAR BRAKE CALIPER 15-25
REAR FENDER 2-9

REAR MASTER CYLINDER 15-17
REAR WHEEL 14-3
REGULATOR/RECTIFIER 16-7
RIGHT CRANKCASE COVER INSTALLATION 9-17
RIGHT CRANKCASE COVER REMOVAL 9-3
SEAT 2-2
SEAT RAIL 2-11
SERVICE RULES 1-1
SECONDARY AIR SUPPLY SYSTEM 3-19
SERVICE INFORMATION
(ALTERNATORISTARTER CLUTCH) 10-1
(BATTERYICHARGING SYSTEM) 16-1
(CLUTCH/GEARSHIFT LINKAGE) 9-1
(COOLING SYSTEM) 6-1
(CRANKCASE/PISTON/CYLINDER) 11-1
(CRANKSHAFT/TRANSMISSION) 12-1
(CYLINDER HEAD/VALVES) 8-1
(ELECTRIC STARTER) 18-1
(ENGINE REMOVAL/INSTALLATION) 7-1
(FRAMEIBODY PANELS/EXHAUST SYSTEM) 2-1
(FRONT WHEEL/SUSPENSION/STEERING) 13-1
(FUEL SYSTEM) 5-1
(HYDRAULIC BRAKE) 15-2
(IGNITION SYSTEM) 17-1
(LIGHTS/METERS/SWITCHES) 19-1
(LUBRICATION SYSTEM) 4-1
(MAINTENANCE) 3-1
(REAR WHEEL/SUSPENSION) 14-1
SHOCK ABSORBER 14-11
SIDE STAND 3-28
SIDE STAND SWITCH 19-19
SPARK PLUGS 3-6
SPECIFICATIONS 1-3
SPEEDOMETER/VEHICLE SPEED SENSOR 19-9
STARTER CLUTCH 10-5
STARTER MOTOR 18-4
STARTER RELAY SWITCH 18-10
STARTER VALVE 5-76
STARTER VALVE SYNCHRONIZATION 5-79
STATOR 10-2
STEERING HEAD BEARINGS 3-32
STEERING STEM 13-26
SUSPENSION 3-28
SUSPENSION LINKAGE 14-9
SWINGARM 14-14
SYSTEM DIAGRAM
(BATTERY/CHARGING SYSTEM) 16-0
(ELECTRIC STARTER) 18-0
(FUEL SYSTEM) 5-5
(IGNITION SYSTEM) 17-0
SYSTEM LOCATION
(FUEL SYSTEM) 5-4
(LIGHTS/METERS/SWITCHES) 19-0
SYSTEM FLOW PATTERN 6-0
SYSTEM TESTING 6-3
TACHOMETER 19-12
THERMOSTAT 6-6
THROTTLE BODY 5-67
THROTTLE OPERATION 3-5
TORQUE VALUES 1-12
TOOLS 1-17
TP SENSOR 5-84
TRANSMISSION 12-9
TROUBLESHOOTING
(ALTERNATORISTARTERCLUTCH) 10-1
(BATTERY/CHARGING SYSTEM) 16-3
(CLUTCH/GEARSHIFT LINKAGE) 9-2
(COOLING SYSTEM) 6-2
(CRANKCASE/PISTON/CYLINDER) 11-2
(CRANKSHAFT/TRANSMISSION) 12-2
(CYLINDER HEAD/VALVES) 8-3
(ELECTRIC STARTER) 18-2
(ENGINE DOES NOT START OR IS HARD TO START) 21-1
(ENGINE LACKS POWER) 21-2
(FRAMEIBODY PANELS/EXHAUST SYSTEM) 2-1
(FRONT WHEEL/SUSPENSION/STEERING) 13-3
(FUEL SYSTEM) 5-3
(HYDRAULIC BRAKE) 15-3
(IGNITION SYSTEM) 17-3
(LIGHTS/METERS/SWITCHES) 19-3
(LUBRICATION SYSTEM) 4-2
(POOR HANDLING) 21-4
(POOR PERFORMANCE AT HIGH SPEED) 21-4
(POOR PERFORMANCE AT LOW AND IDLE SPEED) 21-3
(REAR WHEEL/SUSPENSION) 14-2
TURN SIGNAL 19-6
TURN SIGNAL RELAY 19-21
UPPER COWL 2-5
VALVE CLEARANCE 3-10
VALVE GUIDE REPLACEMENT 8-17
VALVE SEAT INSPECTION/REFACING 8-18
VARIABLE AIR INTAKE VALVE 5-104
WATER PUMP 6-13
WHEELS/TIRES 3-31
WINDSCREEN 2-8
WIRING DIAGRAMS 20-1